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ABSTRACT

The environmental quality of a region depends largely upon the environmental education received by the citizenry. The original act creating the TVA provided for involvement in education experimentation, and the agency has been providing some environmental education or related services since its inception. This study validated the need for a planning process or systematic method for TVA to use in implementing a comprehensive environmental education program involving all of its offices and divisions, as well as the major external entities concerned. The lack of an agency-wide planning strategy and an entity responsible for tying the many elements of an environmental education program together has caused problems which are affecting TVA's credibility, policy, and methods of operation. The purpose of this study, then, was to develop a process model to correct this deficient aspect of the TVA. This document describes the formulation of this model, its implementation and the evaluative procedures used throughout the study. (JP)

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A PROCESS MODEL SHOWING HOW A FEDERAL GOVERNMENT AGENCY, SUCH AS THE TENNESSEE VALLEY AUTHORITY, CAN UTILIZE ITS RESOURCES TO COOPERATE WITH OTHER AGENCIES IN THE DEVELOPMENT OF ENVIRONMENTAL EDUCATION PROGRAMS FOR THE TENNESSEE VALLEY REGION

A Dissertation

by

Jonathan M. Wert

1974

THE UNIVERSITY OF ALABAMA

University, Alabama

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by

JONATHAN M. WERT

A DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in
the Area of Administration and Higher
Education in the Graduate School
of The University of Alabama

UNIVERSITY, ALABAMA

1974

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For additional information please contact:

Jonathan M. Wert
Environmental Education Specialist
Education Relations and
Manpower Development Staff
Tennessee Valley Authority
Knoxville, Tennessee 37902

Phone (615) 637-0101, Ext. 2102

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CHAPTER I

INTRODUCTION

Rationale of the Study

Public concern about pollution and degradation of our environment has brought on new directions and approaches in education. One such approach is termed environmental education. Most of the model environmental education programs at institutions have been problem focused, value-oriented, interdisciplinary in nature, and designed to make education more relevant.

In addition to educational institutions, an extensive number of agencies, organizations, and groups must make contributions to any effective environmental education program. The Tennessee Valley Authority (TVA) is an excellent example of a Federal Government agency that has a significant role to play in improving the quality of life, quality of the environment, and in assisting with the development of programs which improve the quality of environmentally oriented education in the region it serves. Few Federal agencies have the resources to cover the broad spectrum of factors affecting man and his environment as does the TVA. Because of its mission, tremendous resources, and

capabilities, there is no doubt that TVA can serve as a national/regional demonstration in environmental education. TVA Chairman Wagner emphasized this fact when he stated, in an address before the Conservation Education Association, "TVA and the region in which it works should serve the Nation as a pilot plant in environmental education."[1] In addition, he said TVA does its best "to improve the total human environment--environment defined as 'the aggregate of all the external conditions and influences affecting the life and development of the human organism.'"[2]

The writer's employment with TVA as an environmental education specialist has afforded an excellent opportunity to study the organization in relation to environmental education capabilities.

Background

The Tennessee Valley Authority was created by an Act of Congress on May 18, 1933, as an independent corporate agency of the Federal Government. Although TVA was created primarily to regulate flood waters; improve the navigability of the Tennessee River; develop (or cause to happen) reforestation, agricultural, and industrial programs; produce electrical power; and provide for the national defense, the Act gave it broad powers and considerable flexibility. For this reason, TVA could best be thought of as a total resource development

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[1]Aubrey J. Wagner, "TVA--A Pilot Plant in Environmental Education" (address delivered at meeting of the Conservation Education Association, Murray, Ky., Aug. 13, 1973), p. 3. (Multilithed.)

[2]Ibid., p. 6.

agency. TVA is concerned with the total environment--its physical, biological, social, cultural, economic, aesthetic, and political attributes.

The Tennessee River Watershed includes most of Tennessee and parts of Alabama, Georgia, Kentucky, Mississippi, North Carolina, and Virginia. Most of the TVA services are provided in the watershed area. The major exceptions are the power program which serves a larger area and the fertilizer program which is national in scope. The boundaries of the Tennessee River Watershed and TVA power service region are illustrated in Figure 1 on page 4.

The population of the Tennessee River Watershed in 1973 was approximately four million, and the watershed and/or TVA power service region included nearly seven million people.

The provision and authorization for TVA involvement in education experimentation are included in Section 22 of the Tennessee Valley Authority Act. This section reads as follows:

> To aid further the proper use, conservation, and development of the natural resources of the Tennessee River drainage basin and of such adjoining territory as may be related to or materially affected by the development consequent to this Act, and to provide for the general welfare of the citizens of said areas, the President is hereby authorized, by such means or methods as he may deem proper within the limits of appropriations made therefor by Congress, to make such surveys of and general plans for said Tennessee basin and adjoining territory as may be useful to the Congress and to the several States in guiding and controlling the extent, sequence, and nature of development that may be equitably and economically advanced through the expenditure of public funds, or through the guidance or control of public authority, all for the general purpose of fostering an orderly and proper physical, economic, and social development of said areas; and the President is further authorized in making said surveys and plans to cooperate with the States affected thereby, or subdivisions or agencies of

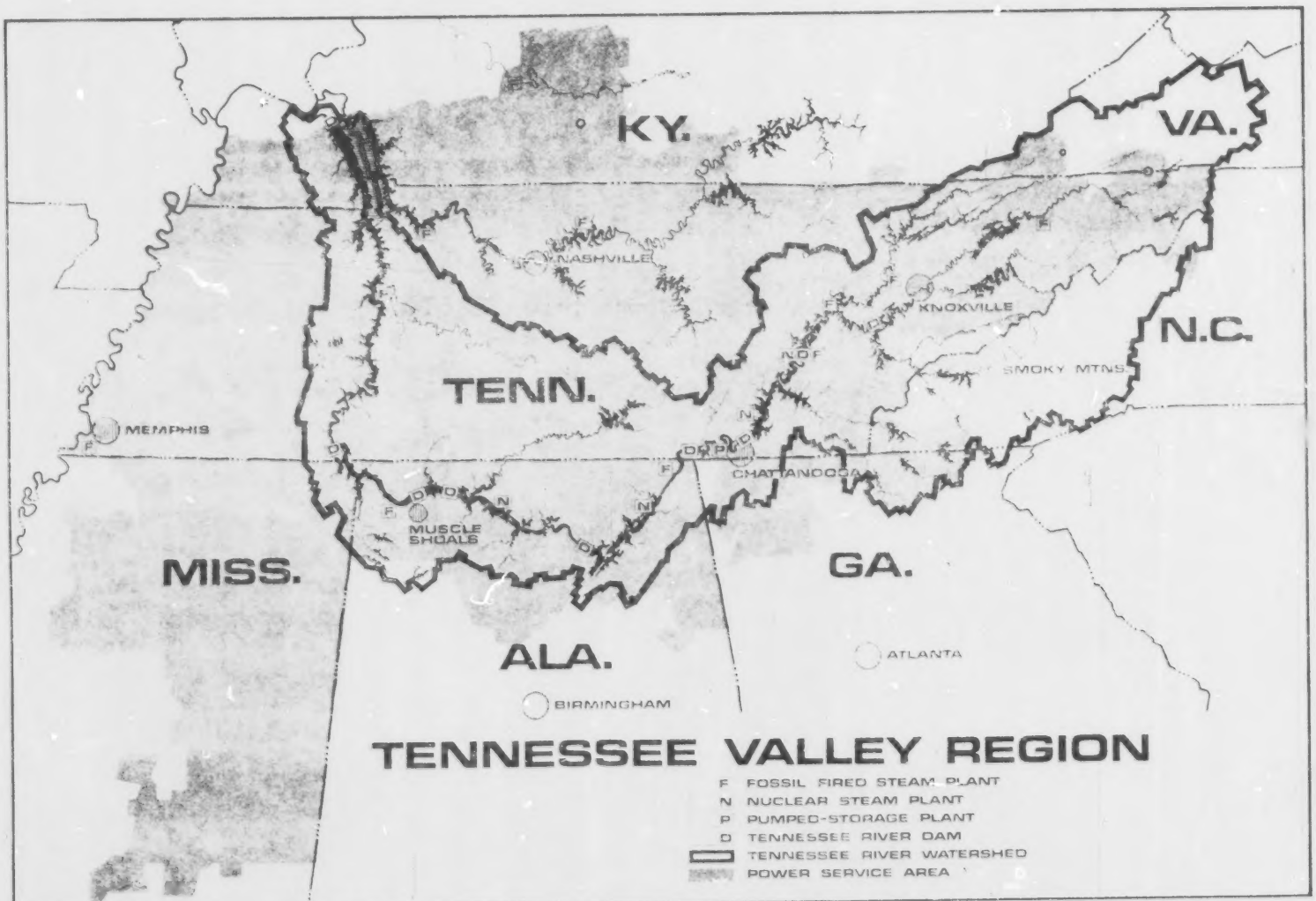

FIGURE 1 BOUNDARIES OF THE TENNESSEE RIVER WATERSHED AND TVA POWER SERVICE REGION

such States, or with cooperative or other organizations, and to make such studies, experiments, or demonstrations as may be necessary and suitable to that end.[3]

The TVA Code stated: "Protection and enhancement of environmental quality is an integral part of TVA's concept of unified development of the resources of the region. . . . At the earliest possible stage in planning its activities, TVA considers their environmental impact in a broad, interdisciplinary manner, which includes the natural and social sciences and the environmental design arts."[4]

Although environmental education was not mentioned in any of the TVA codes per se, it was a part of several programs. As a part of its regional educational improvement program, TVA assists educational institutions, state departments of education, and a variety of resource agencies in the planning, development, and operation of environmental education programs. TVA-wide program services primarily include the provision of (1) technical assistance; (2) environmental data, resource information material, and films; (3) learning opportunities at TVA facilities; and (4) financial support for demonstrations or experiments in environmental education. Some of these kinds of external environmental education or related services are discussed briefly below:

1. Technical Assistance--in such areas as development of academic and intern programs for environmental specialists and technicians; writing of curriculum and other instructional material;

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[3]Tennessee Valley Authority Act, Statutes at Large, XLVIII, 69 (1933).

[4]"Environmental Quality Management," TVA Code IX, ENVIRONMENTAL QUALITY, Administrative Releases, Office of the General Manager, April 23, 1973.

preparation of master plans and proposals for environmental education grants of aid, outdoor laboratories, etc.; evaluating instructional material, books, visual aids, etc.; setting up and participating in workshops and conferences; and in identifying manpower needs and employment opportunities in environmental fields.

2. Environmental Data, Resource Information, and Related Instructional Material--are made available to those individuals, agencies, or groups making requests. Most of this material deals with TVA projects and activities. It includes such media as newsletters, published reports, and films.

3. Learning Opportunities at TVA Facilities--are provided in certain situations to school, college, and university students at all levels. This includes special programs in environmental fields. They range from outdoor environmental education at the residence facilities at Land Between The Lakes to day-use programs with the mobile environmental education laboratory operated by the Division of Forestry, Fisheries, and Wildlife Development; tours of dams and steam plant sites by the Division of Reservoir Properties; and internships in environmentally related fields in different offices and divisions.

4. Financial Support for Demonstrations or Experiments in Environmental Education--is provided in certain situations, e.g., TVA provided both technical and financial assistance to the city of Kingsport, Tennessee, school system to design, purchase, equip, and operate a mobile environmental education laboratory. This

project also involved the development of curriculum material to be used in conjunction with the mobile unit at study areas in both natural and manmade settings.

Statement of the Problem

At the time of this study, no central, formal plan existed for a TVA-wide environmental education effort. There was also no central focal point or staff within TVA which had been delegated the responsibility for assisting in the planning, coordination, and management of an environmental education program. The lack of a plan of action and an entity responsible for tying the many elements of an environmental education program together is contributing to communication problems, fragmentation, overlap, duplication of efforts, and inefficient use of human, fiscal, and other resources. These problems are all affecting TVA's credibility, policy, and methods of operation.

Purpose of the Study

The purpose of this study was to develop a process model which, if implemented, would permit a Federal Government agency such as TVA to enhance its internal environmental education capabilities as well as utilize its resources more effectively when working with other Federal, state, and local agencies and groups in improving environmental quality and the quality of formal and informal education as it pertained to the environment.

Significance of the Study

The study was significant because (1) it provided TVA with a written plan of action for environmental education, something which it

did not have before; (2) it helped and will continue to help put TVA in a more prominent position for supporting environmental education in the United States and Tennessee Valley region; (3) it aroused and will continue to arouse interest and action inside TVA in the area of environmental planning and environmental education; (4) it had application to other Federal agencies, state departments of education, and educational cooperatives; and (5) through the literature review, it brought to light the lack of and need for additional process models for planning comprehensive, problem-focused environmental education programs.

Methodology

The study was conducted in four phases: research, analysis, development, and refinement. The methodology used in the phases was a combination of many techniques, several of which were employed in each phase. The techniques are presented in the sequence in which they were employed.

The research phase used personal professional experience, a literature survey, and a structured interview survey. The writer used his experience in environmental education and a literature search in developing a listing of questions dealing with environmental education planning; environmental concerns; and environmental education program needs, constraints, possibilities, and strategies. A structured interview method was employed to field test the preliminary list of questions and to get answers to them internal and external to TVA.

Specifically, the writer posed the questions during personal interviews with selected individuals from (1) government (Federal and state); (2) educational institutions or organizations; (3) professional

organizations, foundations, interest groups, and citizens' groups; (4) mass media; (5) labor organizations; (6) business and industry; (7) religious organizations; and (8) youth organizations as listed in Appendix A. In some cases the questions asked raised additional questions, and these were incorporated in subsequent interviews. A question the writer continually asked himself was, "Given the particular situation, problem, or concept (that arose during the interview), what must TVA do to plan, implement, and operate a comprehensive, problem-focused environmental education program?"

The analysis phase consisted of prioritizing the data for the questionnaires and conducting a backup literature survey in all areas of significant priority. This, combined with the stated mission of TVA (see Appendix B), provided the basis for the third phase of the study, i.e., the development phase.

The process model development phase used a systems approach based on a goal referenced process. It was articulated chronologically and employed eight component elements, i.e., framework, processes, mechanisms, etc. The process model was described and discussed in three major phases, broken down further into eighteen steps. It included sample questionnaires for conducting a situation assessment and resource inventory. These sample questionnaires probably included most of the information that would go in the final questionnaires which will be developed by implementing the process model.

A refinement phase was conducted in two parts to assure the quality of the process model. The study was reviewed in part and

totally by selected faculty members at The University of Alabama. It was also reviewed and validated by a panel of experts.

The panel of experts had extensive environmental education planning and program development experience with various types of organizations serving different geographic areas, i.e., at the local, state, regional, and/or national levels. Members of the panel included:

Mr. Ronald B. Childress, Environmental Education Coordinator, Kingsport City Schools, Kingsport, Tennessee

Mr. John T. Hershey, Manager, Environmental Programs, University City Science Center, Philadelphia, Pennsylvania

Mr. Hugh B. Montgomery, Consultant on Environment and Resources, The Appalachian Regional Commission, Washington, D.C.

Dr. Harold E. Morse, Senior Policy Advisor for Education, The Appalachian Regional Commission, Washington, D.C.

Mr. R. Jerry Rice, Supervisor of Science, Tennessee State Department of Education, Nashville, Tennessee

Mr. Richard E. Rocchio, Associate Director, Center for Research and Education, Denver, Colorado

The letter which was sent to each panel member with a copy of the process model is shown in Appendix C. Responses received from the panel are shown in Appendix D. Members of the panel indicated that the process model presented a practical and systematic approach for planning and implementing a comprehensive, problem-focused environmental education program and that it could be utilized in their particular situations with only minor modifications.

The comments from The University of Alabama faculty members and the panel of experts were considered in making final refinements and improvements in the process model.

Analysis of the Data

The study did not employ a conventional research design, since statistical inference was not required in the construction of the process model. The writer interviewed a diverse study population, and a simple numerical frequency analysis of interview items proved to be sufficiently discriminatory to draw conclusions as to what subjects should and should not be included in the process model. The final process model, adapted to the TVA situation, evolved from the analysis and synthesis of this original data.

Limitations of the Study

There was a lack of pertinent published material related to process models for environmental education. In addition, the review of the related literature was limited to the last four years.

Definition of Terms

Assessment (Situation).--The collecting of information reflecting people's judgments about the environmental concerns, program needs, and the environmental education services--present and future.

Attitude.--The readiness of a person to react toward or against a thing, situation, or another person to some degree of intensity, e.g., to love or hate something.

Belief.--A fixed opinion or conviction about some situation, person, or thing.

Brainstorming.--To generate within a limited time frame a substantial volume of information on a specific subject, issue, or problem,

through obtaining spontaneous and continuous, creative single concept statements from all members of a small group.

Concern (Environmental).--The feeling of an individual or group toward some type of environmental degradation which helps motivate them or causes them to become involved in remedial action.

Conservation Education.--"The educational process of communicating an understanding of the characteristics, distribution, status, uses, problems, and management policies of our basic natural resources. The emphasis has been on 'stewardship' and the 'wise-use' concept in relation to basic natural resources."[5]

Environment.--The sum total of all the biological, chemical, or physical factors which may influence a plant or animal. Man's environment includes his physical, social, and philosophical environment.

Environmental Education.--"The basic process leading toward the development of a citizenry that is aware of and concerned about the environment and its associated problems, and that has the knowledge, skill, motivation, and commitment to work toward solutions to current and projected problems."[6]

Life Style.--The manner in which an individual or group lives their life behaviorally and culturally and reacts with the environment in a harmonious or detrimental way.

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[5]Governor's Environmental Education Task Force, State of Michigan. Michigan's Environmental Future (Lansing, Mich.: State of Michigan, 1973), p. 88.

[6]Ibid., p. 88.

Nature Study.--"An area of study aimed at developing an understanding of and respect for the natural parts of our environment and cultivating in man the skills of accurate observation."[7]

Network.--A graphic presentation of the series of events or activities over a period of time which must be undertaken in order to complete a project.

Outdoor Education.--"A method of education which uses resources outside the formal classroom. It is used to teach what can be more effectively learned outside, and to enrich, vitalize, and complement areas of the school curricula through the use of outdoor environments."[8]

Pollution.--The presence of contaminating materials or energy which degrades the quality of air, water, and land, or interferes with the proper functioning of life support processes.

Process Model.--A pictorial or conceptual representation of the planning components, indicating the relationships between them without specifying the nature and extent of the relationships. In this study it also includes the discussion of the series of steps which must be undertaken in order for TVA to get from "where it is now" to "where it wants to be" in environmental education.

Resource-Use Education.--"The process of learning how man draws on his biophysical and social environments to meet his life needs."[9]

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[7] Ibid., p. 89.

[8] Ibid., p. 89.

[9] Ibid., p. 90.

Respondent.--An individual who completes and returns the situation assessment or resource inventory questionnaires.

Science Education.--"Any series of related activities that develop an understanding of the conceptual structure and processes of science, that contribute to the student's ability to interpret scientific information, and that enable him to understand the role of science and its applications and limitations within society."[10]

System Approach.--"A process by which needs are identified, problems selected, requirements for problem solution are identified, solutions are chosen from alternatives, methods and means are obtained and implemented, results are evaluated, and required revisions to all or part of the system are made so that the needs are eliminated."[11]

Value.--The degree to which a person views the general worth, importance, or usefulness of something or someone.

Organization of the Study

The introduction, Chapter I, contains the rationale of the study, background, statement of the problem, purpose of the study, significance of the study, methodology, analysis of the data, limitations of the study, definition of terms, and organization of the study.

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[10] Ibid., p. 90.

[11] Roger A. Kaufman, Educational System Planning (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1972), p. 2.

Chapter II describes a review of the related literature.

Chapter III presents the process model.

Chapter IV contains the summary, conclusions, and recommendations.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Environmental education is a relatively new movement and approach to education, having emerged into prominence in the late nineteen sixties. Because of this, and the fact that an extensive search failed to reveal any published works on process models specifically for environmental education, the review of the literature has been limited to that published in the last four years and to that which the writer felt most relevant and important.

In addition to use of the material cited in this review of the literature, the TVA Act (Section 22), and TVA Code IX ENVIRONMENTAL QUALITY (discussed in Chapter I), two additional sources of material were considered in developing the process model in Chapter III. This included the TVA tentative mission statement and continuing objectives and the TVA Organization Bulletin. These documents are briefly discussed in the following paragraphs.

A tentative mission statement and continuing objectives has been prepared by the General Manager's staff for use in designing programs. The TVA Mission dovetails directly into the TVA Act. It describes the general tasks which the agency was established to

perform. The Continuing Objectives dovetail directly into the Mission. They are statements which describe "what" the agency would like to accomplish in society. Appendix B shows the tentative Mission Statement and Continuing Objectives.

An understanding of the broad scope of TVA involvement in resource development and environmental affairs is essential for environmental education planning. Therefore, a description of the organizational structure and functions of offices and divisions is given in Appendix E. Figure 2 shows the organization of TVA pictorially. This description indicates the broad scope of TVA operations and activities which involve nearly 25,000 employees.

Literature which revealed some of the major criticisms of TVA was also reviewed and considered in designing the process model (Chapter III).

The Environmental Crisis

The "Proceedings of the Environmental Education Conference," sponsored by the Center for Research and Education and Region VIII of the U.S. Office of Education, stated the following:

> In general, our society appears to be crisis oriented. That is, we are in many instances apathetic and complacent about problems developing until we are on the threshold of a crisis. We then appear to be extremely capable in mustering together those resources and forces which can help alleviate the impending crisis through focusing in immediately upon solutions to the problem. This strategy has apparently worked well for some crises which have faced this country in the past. It is extremely doubtful that it will work for the critical environmental problems we have created and with which we are now confronted. In dealing with environmental concerns there is a tendency to find a specific solution to a specific critical situation, without realizing the complexities and all of the ramifications inherent in

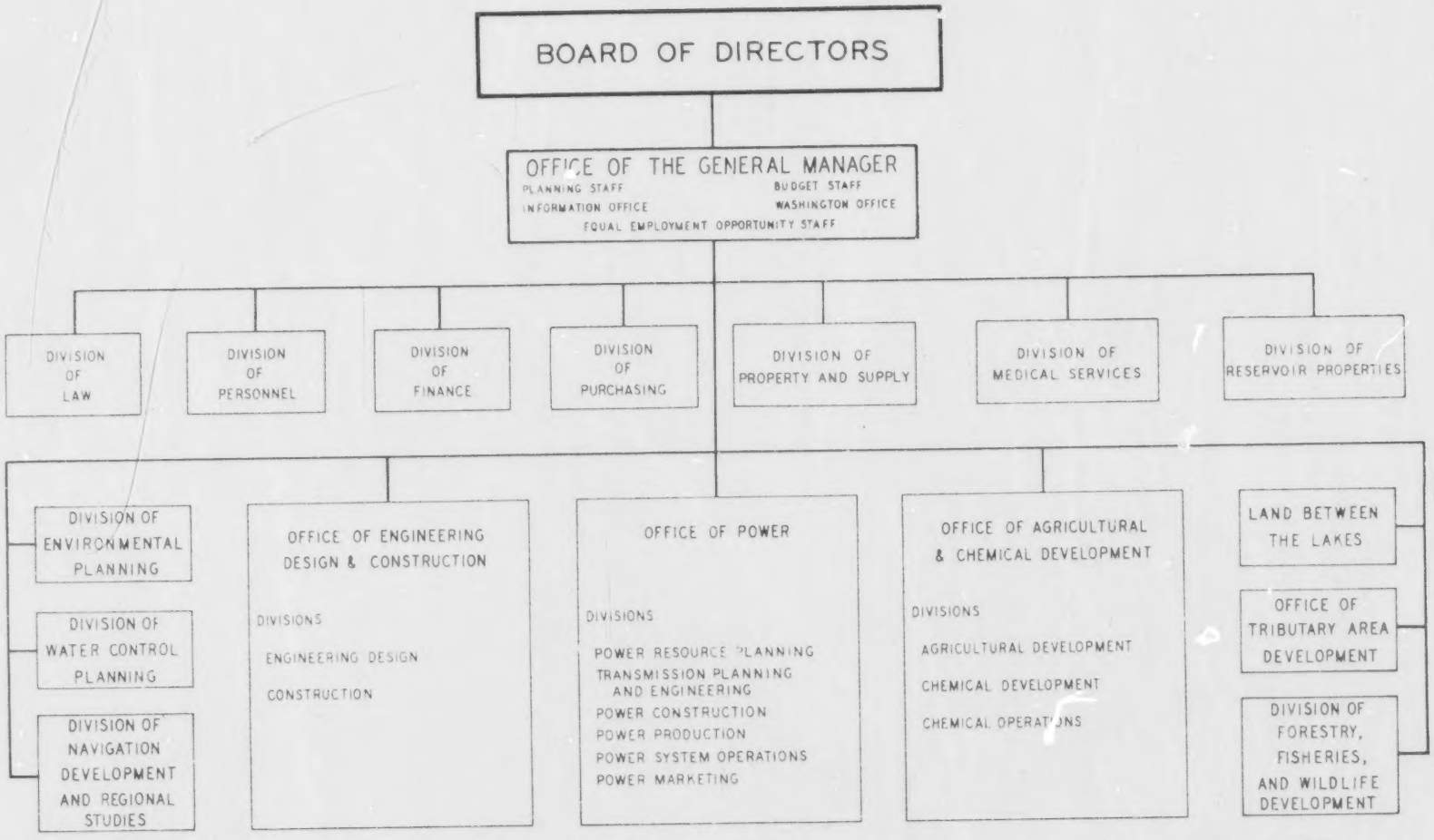

FIGURE 2 THE ORGANIZATION OF THE TENNESSEE VALLEY AUTHORITY

January 1, 1973

> problems which deal with our natural and man-made environments. A specific solution to a specific environmental concern could conceivably produce consequences which may be even more serious than the original problem. Before we focus in on solutions we should take the time to study the nature and implications of the problem through raising analytical questions. Rational, sound solutions to environmental problems may not be found until we learn to ask the appropriate questions.[12]

Stapp stated:

> One of the most important "root causes" of our environmental crisis is the life style of our people. Contributing to an individual's life style are his value orientation, beliefs, and attitudes, as well as the skills that enable him to play an effective role in achieving goals derived from his attitudes.[13]

The Report of the Air Conservation Commission stated, "Every living thing contaminates its environment. To live, it must react with its environment, and in the process of reacting--by the very fact of living and reacting--it produces and casts off wastes."[14] Many of the wastes or byproducts of man and his civilization are converted into harmless substances by the proper functioning of the earth's natural systems. When there is an overabundance of wastes or if they are extremely toxic, the fundamental life processes or sustaining natural systems are impaired or destroyed. When this occurs, the balance of nature is upset.

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[12]Center for Research and Education and Region VIII, U.S. Office of Education. Proceedings of the Environmental Education Conference (Denver, Colo., 1972), Appendix A, p. A-2.

[13]William B. Stapp, "Environmental Education: Approaches to Curriculum Development (K-12)," in Processes For A Quality Environment, ed. by Robert S. Cook and George T. O'Hearn (Green Bay, Wis.: The University of Wisconsin-Green Bay, 1971), p. 79.

[14]American Association for the Advancement of Science, The Report of the Air Conservation Commission, Air Conservation (Washington, D.C.: American Association for the Advancement of Science, 1965), p. 3.

In general, man tends to be far removed from nature and fails to realize that he lives in a closed life support system. Except for solar energy, spaceship earth has all the air, water, and land it will ever have; both space and resources are limited. Commoner stated, "The paradoxical role we play in the natural environment--at once participant and exploiter--distorts our perception of it."[15] He further stated:

> Among primitive people, a person is seen as a dependent part of nature, a frail reed in a harsh world governed by natural laws that must be obeyed if he is to survive. Pressed by this need, primitive peoples can achieve a remarkable knowledge of their environment. The African Bushman lives in one of the most stringent habitats on earth; food and water are scarce, and the weather is extreme. The Bushman survives because he has an incredibly intimate understanding of this environment. A Bushman can, for example, return after many months and miles of travel to find a single underground tuber, noted in his previous wanderings, when he needs it for his water supply in the dry season.
>
> We who call ourselves advanced seem to have escaped from this kind of dependence on the environment.[16]

To many people, food comes from the store and water comes from the tap.

Dickey and Roth stated, "An environmentally literate citizen:

1. should be able to recognize environmental problems when they arise. This means he must acquire a basic understanding of the fundamental interrelationships among men and the biogeochemical environments. Without such understanding he cannot perceive potential breakdowns in the system resulting from technologies and population density-dependent factors--breakdowns that reduce the quality of life and which could ultimately affect the ability of the biosphere to sustain life.
2. must think before acting, examining as many facets of an environmental issue as possible before taking his action position.

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[15] Barry Commoner, The Closing Circle (New York: Bantam Books, Inc., 1972), p. 11.

[16] Ibid., pp. 11-12.

3. rejects short-term gains when they threaten long-range benefits. He recognizes that environmental problems are easier to prevent or arrest than to reverse.
4. takes action to correct environmental imbalances through such approaches as:
   a. altering his consumer and work practices to make them ecologically sound
   b. expressing his concerns and opinions to appropriate officials
   c. suggesting and/or writing and supporting appropriate legislation
   d. initiating and/or participating in group action and encouraging others to identify and take action on environmental issues
   e. supporting appropriate organizations with time and/or money
5. continues to gather information about environmental issues throughout his life, recognizing that knowledge and skills once acquired cannot be expected to serve a lifetime in our rapidly changing world: yesterday's solutions may not fit today's problems.
6. is humane--that is, recognizing the ecological interrelationships of all living things, he extends the concepts of humaneness to all life, striving for reduction to a minimum of cruelty and callousness to all living things.
7. must treat public property and the private property of others with the same respect and stewardship he extends to his own most revered property.
8. has a keen sense of stewardship, maintaining and improving the ability of his home area to sustain and enhance the quality of life. He recognizes a need to use the environment fully but also an obligation to pass it on to the future with as little damage and as much improvement as possible.
9. demonstrates a willingness to curtail some individual privileges and even rights to certain resources for the long-range public good.
10. consciously limits the size of the family he engenders consistent with the limited resources of the biosphere.
11. works to maintain diversity in the total environment--both natural and man-made.
12. is continually examining and re-examining the values of his culture in terms of new knowledge about man and his resources. He then seeks to change values and assumptions that are creating man-environment interactions disruptive to optimum development of human potential and the integrity of the ecosystem."[17]

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[17]Miriam E. Dickey and Charles E. Roth, Beyond the Classroom: Using the Urban Environment As An Instructional Medium (Lincoln, Mass.: The Massachusetts Audubon Society, 1972), pp. 6-7.

Strong, Suttle, and Rosenfield listed the following things in their opinion to be "widely held beliefs--some inherited from the remote past, some of relatively recent origin, but all prevailing in America today--are the key to our environmental crisis:

1. We are God's children for whose sole use the Earth was created.
2. It is proper to use the land, whether owned privately or publicly, as the legal owner sees fit.
3. Wilderness is an enemy that man must conquer--or it will conquer him.
4. Our reserves of raw materials are unlimited, and we have an unlimited capacity for absorbing waste.
5. An ever-expanding gross national product is desirable, and progress is to be measured primarily in economic terms.
6. Enhancement of the nation's prestige and power should be our prime objective.
7. Our future does not depend upon the state of the rest of the world.
8. Application of scientific methods to farming and to harvesting the oceans will provide ample food for a population of any size.
9. Population growth is natural and desirable, and the rate of growth should be determined entirely by the inclination of the individual family.
10. Technology will solve all our problems no matter how much damage we do."[18]

These same authors go on to say that if "we were to rethink our religion, extend our ethical concepts to encompass the biotic community, accept the limitations of science and technology, and substitute reality for myth and fact for wishful thinking, we might come to hold some such beliefs as these:

1. God is the benefactor of all living things.
2. Use of the land, whether publicly or privately owned, should conform to the requirements of the biotic community.
3. Wilderness is not unfriendly and should be protected for the sake of our physical and mental health as well as for itself.

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[18] Douglas H. Strong, Gary D. Suttle, and Elizabeth S. Rosenfield, "Key to the Environmental Crisis," The Journal of Environmental Education, Vol. 3, No. 4 (Summer 1972), pp. 46-47.

4. Neither our raw materials nor our ability to dispose of waste are unlimited; both our consumption of raw materials and our disposal of waste should be regulated as though Earth were indeed a 'space ship.'
5. Environmental betterment--not expanding production--is the proper measure of 'progress.'
6. Our nation's health and ecological stability are more important than its power and prestige.
7. All the peoples of the Earth are interdependent and mutually responsible for their Earth's physical well-being.
8. Since we do not know and have no way of knowing at present how much food the Earth and the oceans can supply, we must assume that there is a limit to the number of human beings that can be properly nourished.
9. World population must be stabilized at a level permitting a good life for all; the size of families is therefore no longer exclusively a private concern.
10. Technology is a tool as valuable as the use we make of it but is not a God-given answer to every human problem.

Only when we can subscribe to these principles, and only when we have changed our practices to conform with them, shall we be able to live in equilibrium with nature. And not until we have achieved such an equilibrium shall we have reason for optimism about the future of our planet."[19]

President Richard M. Nixon, in his message on the Nation's environment to the Congress of the United States in 1970, stated:

> Environmental deterioration is not a new phenomenon. But both the rate of deterioration and its critical impact have risen sharply in the years since the Second World War. Rapid population increases here and abroad, urbanization, the technology explosion and the patterns of economic growth have all contributed to our environmental crisis. While growth has brought extraordinary benefits, it has not been accompanied by sufficiently foresighted efforts to guide its development.
>
> . . . . . .
>
> The basic causes of our environmental troubles are complex and deeply imbedded. They include: our past tendency to emphasize quantitative growth at the expense of qualitative growth; the failure of our economy to provide full accounting for the social costs of environmental pollution; the failure to take environmental factors into account as a normal and necessary part of our planning and decision-making; the inadequacy of our institutions for dealing with problems that cut across traditional political boundaries; our dependence on conveniences, without regard for their impact on the

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[19] Ibid., p. 48.

environment; and more fundamentally, our failure to perceive the environment as a totality and to understand and to recognize the fundamental interdependence of all its parts, including man himself.

It should be obvious that we cannot correct such deep-rooted causes overnight. Nor can we simply legislate them away. We need new knowledge, new perceptions, new attitudes--and these must extend to all levels of government and throughout the private sector as well: to industry; to the professions; to each individual citizen in his job and in his home. We must seek nothing less than a basic reform in the way our society looks at problems and makes decisions.

Our educational system has a key role to play in bringing about this reform. We must train professional environmental managers to deal with pollution, land planning, and all the other technical requirements of a high quality environment. It is also vital that our entire society develop a new understanding and a new awareness of man's relation to his environment--what might be called "environmental literacy." This will require the development and teaching of environmental concepts at every point in the educational process.[20]

The Environmental Education Act of 1970

The Environmental Education Act of 1970 added new thrust and dimension to the field of environmental education by providing funds for program development to a variety of institutions, agencies, and groups. It provided funds for:

1. colleges and universities to develop materials for teaching environmental studies,
2. training school teachers in environmental studies,
3. elementary and secondary schools for teaching environmental studies,
4. communities to develop environmental education programs, and
5. the preparation of materials on the environment for use by the mass media.

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[20]Council on Environmental Quality, The President's Message to Congress, Environmental Quality (Washington, D.C.: Government Printing Office, 1970), pp. vi-vii.

The Definition of Environmental Education

The Environmental Education Act of 1970 stated:

> The term "environmental education" means the educational process dealing with man's relationship with his natural and manmade surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment.[21]

Michigan's master plan for environmental education defined environmental education as "the basic process leading toward the development of a citizenry that is aware of and concerned about the environment and its associated problems, and that has the knowledge, skill, motivation, and commitment to work toward solutions to current and projected problems."[22] In addition, the above plan stated:

> The process is not confined to "formal" educational systems such as elementary and secondary schools, but also includes "non-formal" educational media such as radio, television, the press, industrial bulletins, professional journals, newsletters, advertising, conversation, and personal example.
>
> Environmental education emphasizes problem-solving techniques aimed at real problems in the local community as they are felt today or are anticipated for the future.
>
> Since environmental education is a process, it involves becoming informed and learning how to be effective in solving and preventing the full range of environmental problems. Environmental education is interdisciplinary, drawing its content from all fields--the humanities, the social sciences, economics, psychology, engineering, and the biological and physical sciences.[23]

While the definitions of environmental education given in the Environmental Education Act of 1970 and Michigan's master plan for

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[21] Environmental Education Act, 84 Stat. 1312 (1970).

[22] State of Michigan, Michigan's Environmental Future, op. cit., p. 88.

[23] Ibid., p. 14.

environmental education provide excellent working definitions, it is almost impossible to define the term adequately in one sentence. For the purposes of this study, environmental education refers to all environmentally oriented formal and informal education, activities, or training directed toward informing or teaching people of all age levels and walks of life about man's relationship to his total environment and its associated problems. Formal education refers to that education which takes place in schools, colleges, and universities. Informal education refers to that education which occurs through television, radio, newsletters, newspapers, camping, etc.

There have been semantic problems associated with the definition of "environmental education" ever since the term has become widely used. In some instances, institutions, agencies, etc., changed the name of their programs to the more popular "environmental education" (or environmental something) without modifying the program or changing the content. As a result, there are numerous programs around the country under the name "environmental education" which are not really problem focused and action oriented. In addition, there has been a problem getting people from various professions to agree on or accept any one definition or philosophy of environmental education--unless that definition or philosophy in question is their own.

Some individuals or groups dislike the idea of their field becoming a part of the whole--the whole being the more inclusive environmental education. Others contend that "outdoor education," "conservation education," "science education," "nature study," and

"environmental education" are one and the same rather than the forerunners of the latter. The Michigan master plan for environmental education stated:

> Though related to them in important ways, environmental education should not be considered synonymous with such terms as "conservation education," "outdoor education," "resource-use education," "science education," or "nature study." These fields share common elements but each differs in emphasis and history. Each is justified in itself as making important contributions to society and to environmental education.[24]

A report by the Educational Facilities Laboratories, which summarized the opinions of twenty-six nationally known recognized authorities in disciplines related to environmental education, had the following to say:

> Not all educators and planners agree on a definition of environmental education, but they know what environmental education is and what it is not.
>
> Environmental education is:
>
> -- a new approach to teaching about man's relationship to his environment--how he affects and is affected by the world around him
> -- an integrated process dealing with man's natural and man-made surroundings
> -- experience-based learning using the total human, natural, and physical resources of the school and surrounding community as an educational laboratory
> -- an interdisciplinary approach which relates all subject areas to a whole earth "oneness of purpose"
> -- oriented toward survival in an urban society
> -- life-centered and oriented toward community development
> -- an approach for developing self-reliance in responsible, motivated members of society
> -- a rational process to improve the quality of life
> -- geared toward developing behavior patterns that will endure throughout life
>
> The consensus is that environmental education is not:
>
> -- conservation, outdoor resource management or nature study (although these areas may be included in an environmental education program)

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[24] Ibid., p. 14.

-- a cumbersome new program requiring vast outlays of capital and operating funds
-- a self-contained course to be added to the already overcrowded curriculum
-- merely getting out of the classroom.[25]

The New Environmental Education Program publication of the U.S. Office of Education stated:

> Some environmentalists would have the environmental education program support an expanded version of traditional conservation education. Others would build on the tradition of outdoor education. Some scientists see it as a form of applied science education; social scientists would direct it toward the study of man-made environments. Effective environmental education must combine all of these elements and serve as a vehicle for bringing about innovation and reform in our educational systems. Such reform must change not only what is taught but also how it is taught. Environmental education must emphasize the use of the environment in the education process itself and carry on throughout an individual's lifetime.
>
> Environmental education then, deals with all forms and levels of life, their interrelationships, and our perceptions of them. This synergistic or cooperative action approach, the essence of environmental education, is concerned with what is meaningful and relevant to our times and our existence.[26]

Due to the diversity of views concerning the definition and philosophy of environmental education, there is a definite need for bringing environmental educators together to resolve problems. This could greatly enhance the environmental education movement in the country.

The Objectives of Environmental Education

The University of Michigan, School of Natural Resources,

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[25]Educational Facilities Laboratories, A Report from Educational Facilities Laboratories, Places for Environmental Education (New York: Educational Facilities Laboratories, Inc., 1971), p. 1.

[26]U.S. Department of Health, Education, and Welfare, The New Environmental Education Program of the U.S. Office of Education (Washington, D.C.: Government Printing Office, 1971), pp. 1-2.

publication on Environmental Education stated, "The major objectives of environmental education are to help individuals acquire:

1. A clear understanding that man is an inseparable part of a system consisting of man, culture, and the biophysical environment, and that man has the ability to alter the interrelationships of this system.
. . . . . .
2. A broad understanding of the biophysical environment, both natural and man-made, and its role in contemporary society.
. . . . . .
3. A fundamental understanding of the biophysical environmental problems confronting man, how these problems can be solved, and the responsibility of citizens and government to work toward their solution.
. . . . . .
4. Attitudes of concern for the quality of the biophysical environment which will motivate citizens to participate in biophysical environmental problem-solving."[27]

Former U.S. Commissioner of Education, James E. Allen, Jr., briefly summed up the specific tasks of environmental/ecological education as follows:

> Awareness of how we and our technology affect and are affected by our environment;
> Concern for man's new and unique responsibility to re-establish and to create beneficially balanced relationships among all forms of life within the closed earth system;
> Motivation and training to enable us to acquire and spread the knowledge and skills that will help us solve interrelated environmental problems and prevent their future occurrence.[28]

The Model Environmental Education Program

In the writer's opinion, a model environmental education program for TVA would be one which helps the individual become (1) aware of the

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[27]The University of Michigan, School of Natural Resources, Environmental Education (Ann Arbor, Mich.: University of Michigan Press, 1970), pp. 4-7.

[28]James E. Allen, Jr., "Education for Survival," American Education, March 1970, p. 22.

environment and its associated problems; (2) concerned, knowledgeable, and accurately informed about the problems; (3) knowledgeable and informed about the possible future consequences of the problems; (4) engaged in clarifying values and making decisions based on attitudes and beliefs; (5) involved in finding the solutions to environmental problems--alternatives, trade-offs, compromises, and costs; and (6) committed to and involved in some type of constructive action which enhances environmental quality. The six criteria stated above should guide program development in TVA.

Environmental Education and Planning

Environmental education planning and program implementation are two of the best processes for directing change. Man lives in a dynamic society which is constantly changing. It is difficult to keep abreast of the many changes occurring in the world and even more difficult to project into the future or to direct change. Toffler stated, "To survive, to avert what we have termed future shock, the individual must become infinitely more adaptable and capable than ever before."[29]

Kaufman had the following to say about planning:

> A plan is a projection of what is to be accomplished to reach valid and valued goals. It includes the elements of:
>
> Identifying and documenting needs.
>
> Selecting among the documented needs those of sufficient priority for action.
>
> Detailed specification of outcomes or accomplishments to be achieved for each selected need.

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[29]Alvin Toffler, Future Shock (New York: Bantam Books, Inc., 1971), p. 35.

Identification of requirements for meeting each selected need, including specifications for eliminating the need by problem solving.

A sequence of outcomes required to meet the identified needs.

Identification of possible alternative strategies and tools for accomplishing each requirement for meeting each need, including a listing of the advantages and disadvantages of each set of strategies and tools (or methods and means).

Planning, then, is only concerned with determining what is to be done so that practical implementing decisions may be made later. Planning comes before doing. Planning is a process for determining "where to go" and identifying the requirements for getting there in the most effective and efficient manner possible.[30]

Cook stated:

If any one managerial function could be labeled as the primary function, it would be planning. The basic step in planning is the establishment of objectives, goals, and purposes or functions. Objectives are so fundamental that a few more basic and important points should be made. First of all, the primacy of objectives is inviolate. They are the end of all action. They channel planning and guide organizing, directing, and controlling. They are the most important consideration in decision-making, no matter in which area of management it occurs. Second, objectives are not the same between organizations. They vary with the type of organization and the circumstances involved. Third, objectives must be practical. They should be set at a point in time which can be reached. Fourth, objectives should be broken into long range and short range objectives, and the accomplishment of short range objectives should support the accomplishment of long range objectives. Finally, a hierarchy of objectives usually can be established for either an organization or a project. It is difficult for an individual to work effectively or efficiently without definite goals. Unless these goals are specified by the organization, an individual may have to specify his own goals even though they may be the wrong ones, or may not contribute to organizational or project objectives.[31]

Buckner stated:

Planning is the conscious determination of alternative courses and/or methods of action for accomplishing a valued target in light

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[30]Kaufman, Educational System Planning, op. cit., p. 6.

[31]Desmond L. Cook, Educational Project Management (Columbus, Ohio: Charles E. Merrill Publishing Company, 1971), pp. 19-20.

of relevant situations and conditions, future probabilities and perceptions of consequences to be experienced. It includes assessment, integration, time-phasing, cost estimates, evaluation and communication in relation to the target. Products of planning are clearly and cogently stated objectives and strategies for action. These products are developed by:

1. Analyzing, evaluating and interpreting relevant data in relation to objectives to be achieved
2. Systematically appraising choice-consequence relations
3. Selecting preferred alternatives for the achievement of objectives
4. Simulating and graphically portraying the functions and tasks (work) required to achieve each objective
5. Determining probability factors for successful and effective achievement.

Planning and its products must be related to and internally consistent with relevant organizational philosophies, purposes, priorities, policies and programs.[32]

Koontz and O'Donnell stated, "The most useful method of classifying managerial functions is to group them around the activities of planning, organizing, staffing, directing, and control."[33] These authors described each of the above terms as follows:

> Planning Planning involves selecting the objectives and the policies, programs, and procedures for achieving them--either for the entire enterprise or for any organized part thereof. Planning is, of course, decision making, since it involves selecting among alternatives. . . .
>
> . . . . . .
>
> Organizing Organizing involves the establishment of an intentional structure of roles through determination and enumeration of the activities required to achieve the goals of the enterprise and each part of it, the grouping of these activities, the assignment of such groups of activities to a manager, the delegation of authority to carry them out, and provision for coordination of authority relationships horizontally and vertically in the organization structure. . . .
>
> . . . . . .
>
> Staffing Staffing involves manning, and keeping manned, the positions provided for by the organization structure. It thus

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[32]Allen L. Buckner, Network-Based Management Procedures (Burlingame, Calif.: San Mateo County Board of Education, 1970), pp. 3-4.

[33]Harold Koontz and Cyril O'Donnell, Principles of Management (New York: McGraw-Hill Book Company, 1955), pp. 47-48.

> necessitates defining manpower requirements for the job to be done, and includes inventorying, appraising, and selecting candidates for positions; compensating; and training or otherwise developing both candidates and incumbents to accomplish their tasks effectively. . . .
>
> Directing Directing involves guiding and supervising subordinates. . . .
>
> . . . . . .
>
> Controlling Control seeks to compel events to conform to plans. Thus it measures performance, corrects negative deviations, and assures the accomplishment of plans.[34]

Summary of the Review of the Literature

In view of the urgency of the environmental crisis and the role which education can play in solving this crisis, it seems logical that the first step for TVA should be the development of a "plan on how to plan" for environmental education. The process model (Chapter III) presents the strategies for developing and implementing a TVA comprehensive environmental education program. The process model has been designed to dovetail into the TVA management system for planning, coordinating, controlling, evaluating, and reporting work.

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[34] Ibid., pp. 48-50.

CHAPTER III

PROCESS MODEL

Introduction

This chapter presents a process model for planning and implementing a TVA-wide environmental education program. The model was designed to dovetail into TVA's tentative mission and continuing objectives, which are shown in Appendix B. Figure 3 depicts a conceptual process model for planning and implementing a TVA-wide environmental education program. The conceptual process model reflects roles and relationships involved in the planning process. A network depicting the events and activities to be completed in carrying out the process model is shown in Figure 4. In this network each of the eighteen steps corresponds to the steps described in the process model phases.

Process Model Phases

The process model consists of three distinct phases which are further broken down into steps and substeps when appropriate. The phases and steps are listed as follows:

Phase One: Establishment of Program Objectives

Step One: Formal Designation of a TVA-Wide Environmental Education Planning Unit

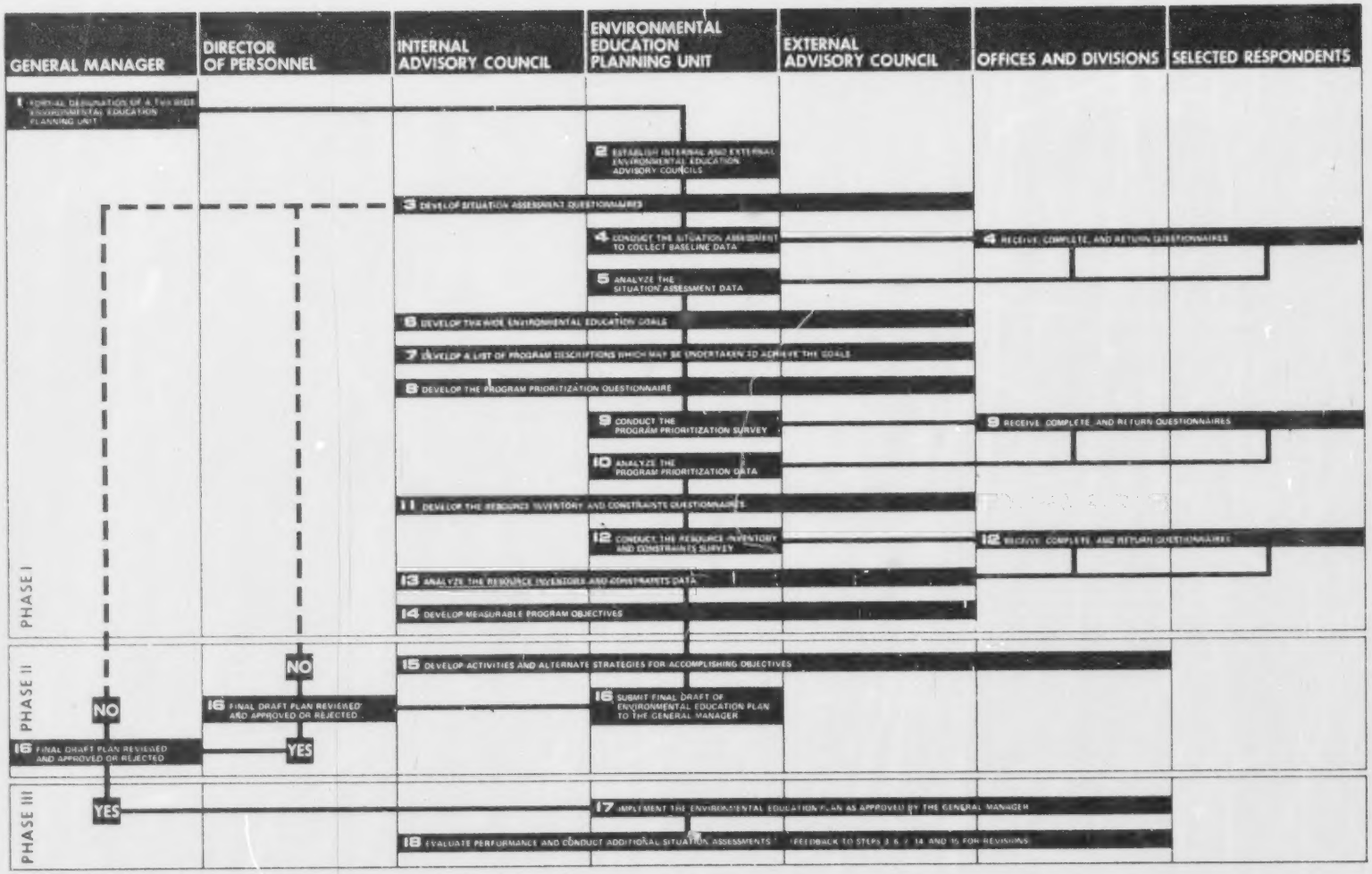
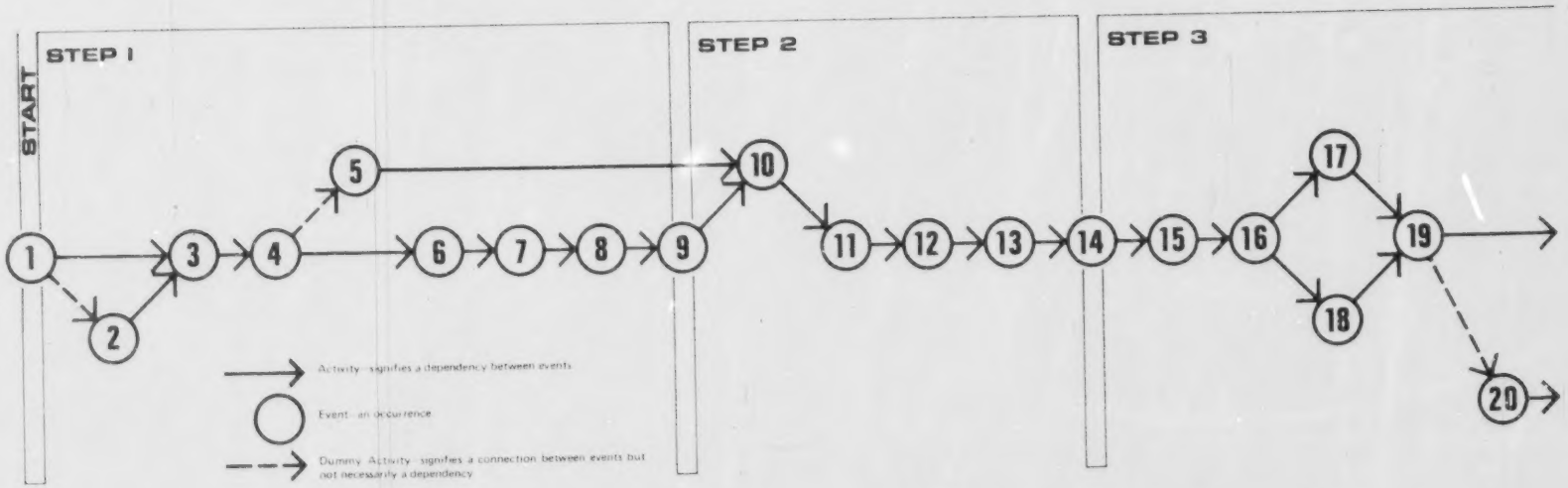
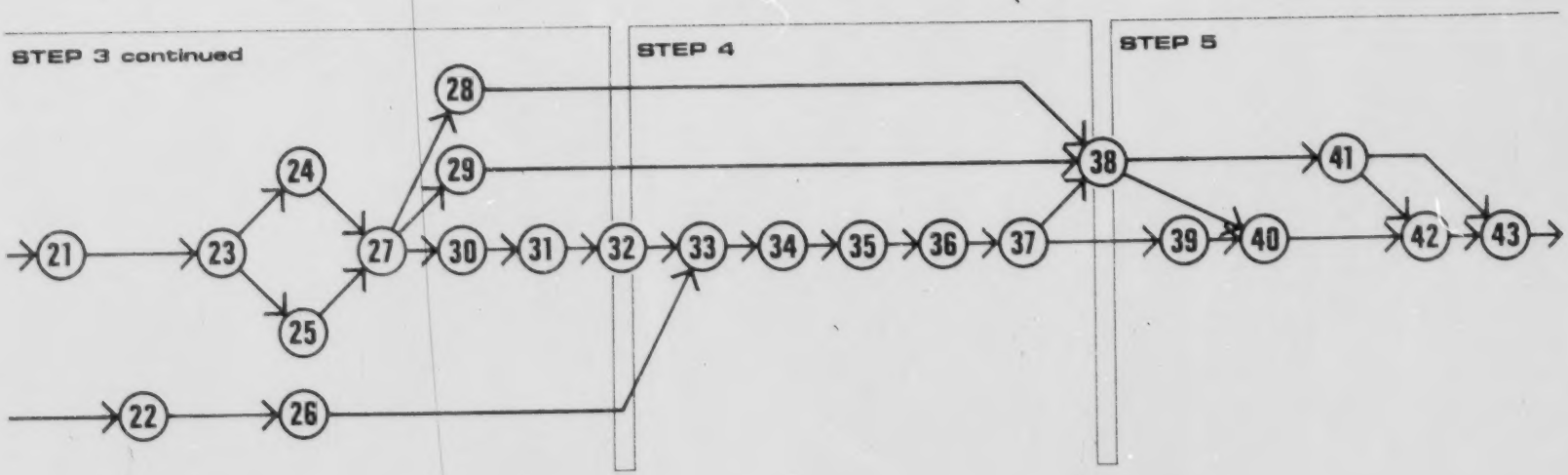

GENERAL MANAGER
DIRECTOR OF PERSONNEL
INTERNAL ADVISORY COUNCIL
ENVIRONMENTAL EDUCATION PLANNING UNIT
EXTERNAL ADVISORY COUNCIL
OFFICES AND DIVISIONS
SELECTED RESPONDENTS
1 FORMAL DESIGNATION OF A TVA-WIDE ENVIRONMENTAL EDUCATION PLANNING UNIT
2 ESTABLISH INTERNAL AND EXTERNAL ENVIRONMENTAL EDUCATION ADVISORY COUNCILS
3 DEVELOP SITUATION ASSESSMENT QUESTIONNAIRES
4 CONDUCT THE SITUATION ASSESSMENT TO COLLECT BASELINE DATA
4 RECEIVE, COMPLETE, AND RETURN QUESTIONNAIRES
5 ANALYZE THE SITUATION ASSESSMENT DATA
6 DEVELOP TVA-WIDE ENVIRONMENTAL EDUCATION GOALS
7 DEVELOP A LIST OF PROGRAM DESCRIPTIONS WHICH MAY BE UNDERTAKEN TO ACHIEVE THE GOALS
8 DEVELOP THE PROGRAM PRIORITIZATION QUESTIONNAIRE
9 CONDUCT THE PROGRAM PRIORITIZATION SURVEY
9 RECEIVE, COMPLETE, AND RETURN QUESTIONNAIRES
10 ANALYZE THE PROGRAM PRIORITIZATION DATA
11 DEVELOP THE RESOURCE INVENTORY AND CONSTRAINTS QUESTIONNAIRES
12 CONDUCT THE RESOURCE INVENTORY AND CONSTRAINTS SURVEY
12 RECEIVE, COMPLETE, AND RETURN QUESTIONNAIRES
13 ANALYZE THE RESOURCE INVENTORY AND CONSTRAINTS DATA
14 DEVELOP MEASURABLE PROGRAM OBJECTIVES
PHASE I
15 DEVELOP ACTIVITIES AND ALTERNATE STRATEGIES FOR ACCOMPLISHING OBJECTIVES
16 SUBMIT FINAL DRAFT OF ENVIRONMENTAL EDUCATION PLAN TO THE GENERAL MANAGER
NO
16 FINAL DRAFT PLAN REVIEWED AND APPROVED OR REJECTED
NO
16 FINAL DRAFT PLAN REVIEWED AND APPROVED OR REJECTED
YES
PHASE II
17 IMPLEMENT THE ENVIRONMENTAL EDUCATION PLAN AS APPROVED BY THE GENERAL MANAGER
YES
18 EVALUATE PERFORMANCE AND CONDUCT ADDITIONAL SITUATION ASSESSMENTS
FEEDBACK TO STEPS 3, 6, 7, 14, AND 15 FOR REVISIONS
PHASE III

FIGURE 3 CONCEPTUAL PROCESS MODEL FOR PLANNING AND IMPLEMENTING A TVA-WIDE ENVIRONMENTAL EDUCATION PROGRAM



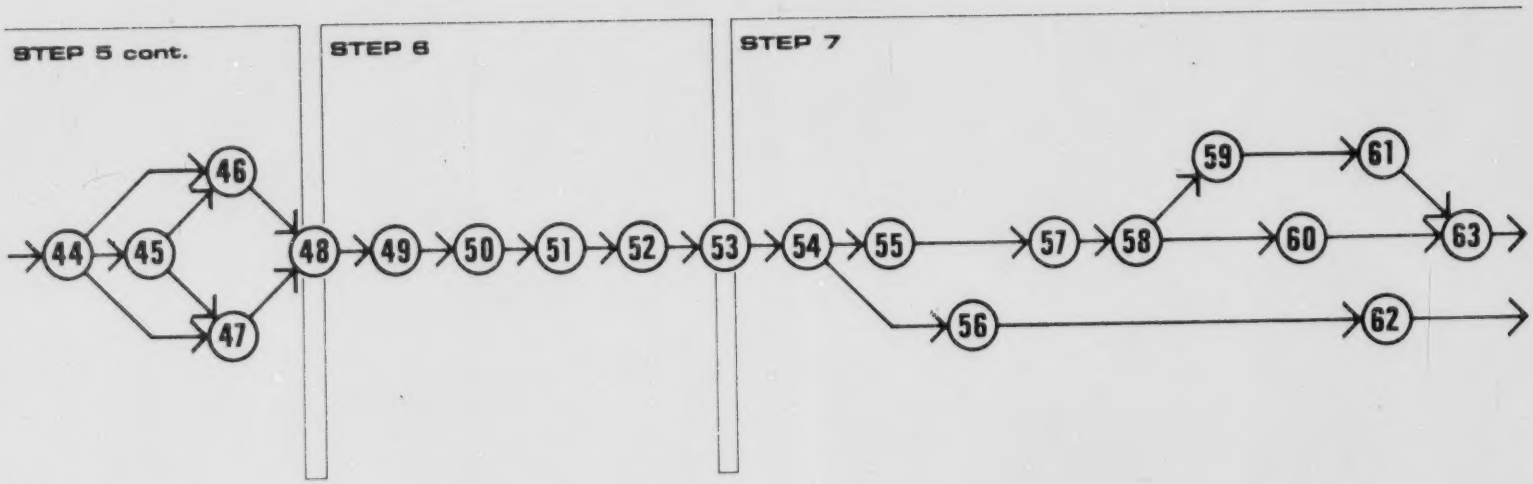
1 Secure appointment with division director.
2 Complete rank order list of alternative planning unit locations.
3 Make presentation to division director.
4 Division director approves process model.
5 Identify potential members of advisory council (s).
6 Secure appointment with General Manager.
7 Make presentation to General Manager.
8 General Manager approves location of planning unit.
9 Establish planning unit.
10 Notify supervisors of potential council member selections.
11 Supervisors approve (as appropriate) council appointees.
12 Notify council members of appointment.
13 Council memberships accepted.
14 Establish internal and external councils.
15 Prepare content categories for each situation assessment questionnaire.
16 Brainstorm content of situation assessment with advisory councils.
17 Prepare first draft of format of situation assessment questionnaires.
18 Prepare first draft of questionnaires.
19 Start questionnaire validation interviews.
20 Determine criteria for selecting respondents with advisory councils.

FIGURE 4 NETWORK DEPICTING THE EVENTS TO BE COMPLETED IN CARRYING OUT THE PROCESS MODEL



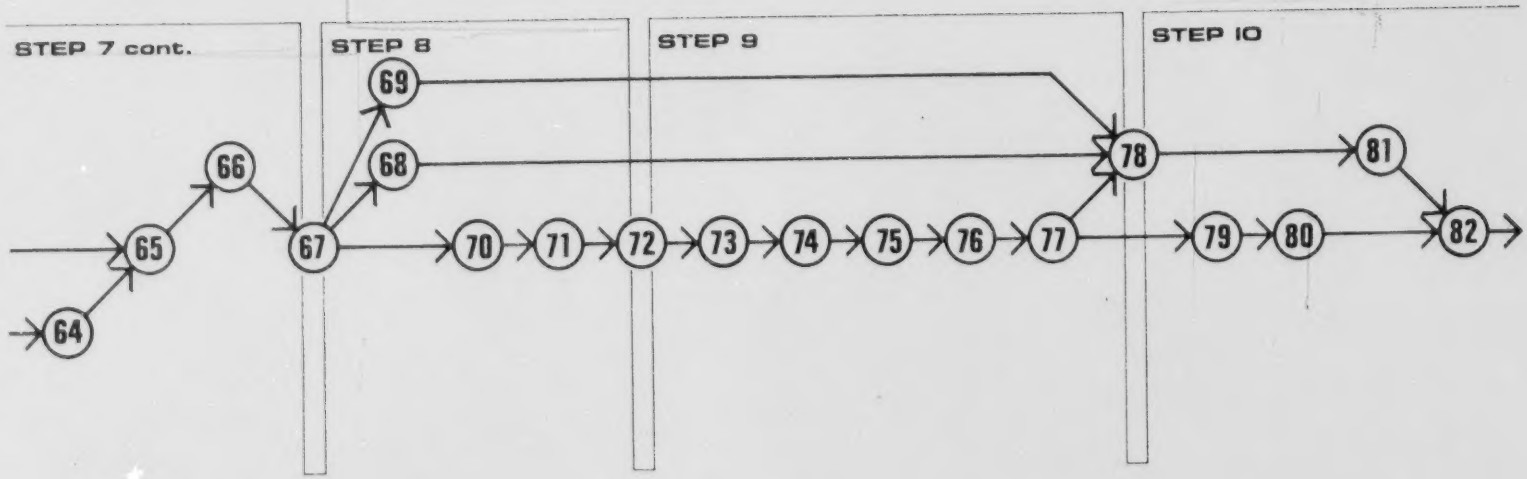
21 Complete questionnaire validation interviews.
22 Determine size of respondent group.
23 Rank questionnaire items according to retranslation method.
24 Agree on final situation assessment questionnaire format.
25 With advisory councils, agree on final content for situation assessment questionnaires.
26 Determine respondent groups.
27 Write and type draft questionnaires.
28 Complete data analysis matrix.
29 Decide on what statistical manipulations will be used.
30 Edit draft questionnaires.
31 Type and proof final questionnaires.
32 Print questionnaires.
33 Mail questionnaires.
34 Questionnaires in the hands of respondents.
35 Respondents start filling out questionnaires.
36 Respondents complete filling out questionnaires.
37 Respondents return completed questionnaires.
38 Start recording questionnaire data on matrix.
39 All questionnaires in hands of planning unit.
40 Start placing data into the computer.
41 Finish recording data on matrix.
42 Finish placing data into the computer.
43 Complete all computer manipulations.

FIGURE 4 Continued



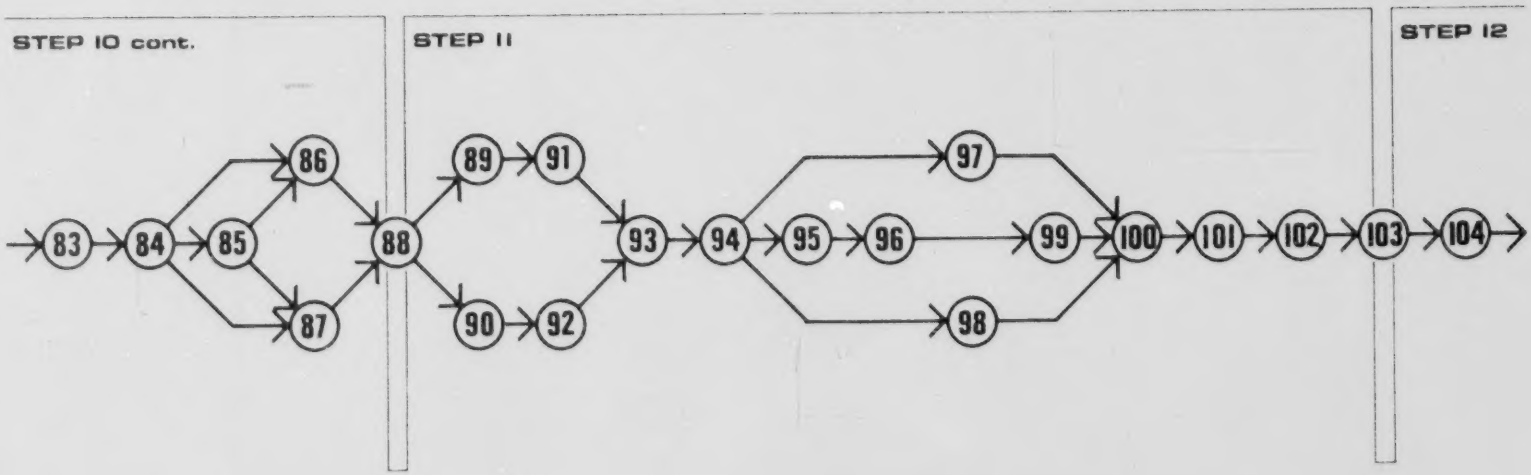
44 Start analyzing and interpreting processed data.
45 Finish analyzing and interpreting processed data.
46 Prepare narrative description of analysis.
47 Write set of suggested goals based on analysis.
48 Publish full results of situation assessment.
49 Advisory councils start review and discussion of draft goals and situation assessment data.
50 Advisory councils finish review and discussion of draft goals and situation assessment data.
51 Advisory councils recommend goals for TVA-wide environmental education program.
52 Final goals approved.
53 Publish final goals.
54 Request literature about programs from the United States Office of Education (USOE) and the Educational Resources Information Center (ERIC).
55 Begin review of program literature.
56 Prepare criteria for matching program possibilities with goals.
57 Finish review of program literature.
58 Prepare draft list of environmental education program possibilities.
59 Begin preparation of criteria for selecting program possibilities.
60 Advisory council members review and discuss environmental education program possibilities.
61 Advisory councils meet to brainstorm additional program possibilities.
62 Begin matching program possibility statements with goals.
63 Finish criteria for selecting program possibilities.

FIGURE 4 Continued



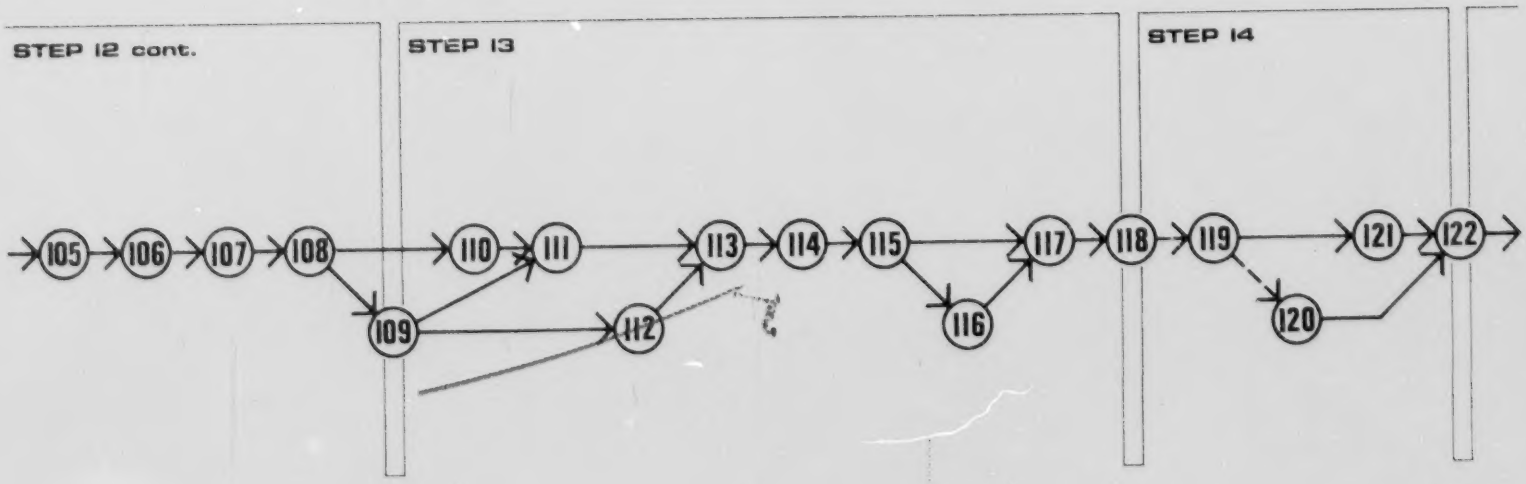
64 Finish matching program possibility statements with goals.
65 Using criteria, advisory councils select top four to five program possibilities for each goal.
66 Select program prioritization questionnaire format.
67 Publish draft of program prioritization questionnaire.
68 Finish data analysis matrix.
69 Decide what statistical manipulations will be used.
70 Review program prioritization questionnaire with advisory councils.
71 Select final format and content for program prioritization questionnaire.
72 Print program prioritization questionnaire.
73 Mail program prioritization questionnaire.
74 Program prioritization questionnaire in hands of respondents.
75 Respondents start filling out the program prioritization questionnaire.
76 Respondents complete filling out program prioritization questionnaire.
77 Respondents return completed program prioritization questionnaire.
78 Planning unit begins recording data on data analysis matrix.
79 All program prioritization questionnaires in hands of planning unit.
80 Begin placing data into the computer.
81 Finish recording data on matrix.
82 Finish placing data into the computer.

FIGURE 4 Continued



83 Complete all computer manipulations.
84 Start analyzing and interpreting processed data.
85 Finish analyzing and interpreting processed data.
86 Write narrative description of analysis.
87 Make final program suggestions from analysis of data.
88 Publish full results of program based on the analysis of questionnaire results.
89 Prepare draft resource inventory questionnaire.
90 Prepare draft constraints questionnaire.
91 Brainstorm resource inventory questionnaire content with advisory councils.
92 Brainstorm constraints questionnaire content with advisory councils.
93 Begin interviews to validate questionnaires.
94 Complete interviews to validate questionnaires.
95 Determine, with advisory councils, criteria for selecting respondents.
96 Determine size of respondent groups.
97 Decide on final questionnaire format.
98 Agree with advisory councils on final content of questionnaire.
99 Determine respondent names and addresses.
100 Write and type draft questionnaires.
101 Edit draft questionnaires.
102 Type and proof final questionnaires.
103 Print questionnaires.
104 Mail questionnaires.

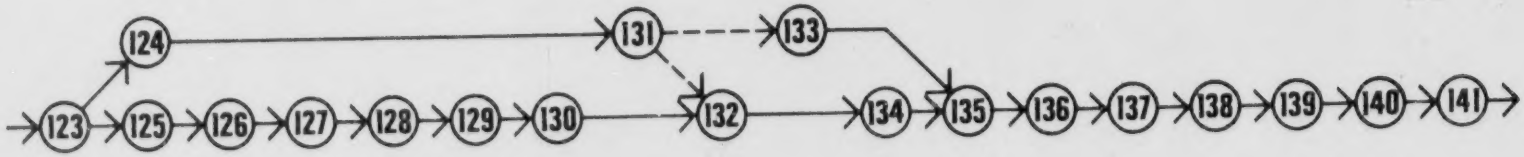
FIGURE 4 Continued



105 Questionnaires in hands of respondents.
106 Respondents start filling out questionnaires.
107 Respondents complete filling out questionnaires.
108 Respondents return completed questionnaires.
109 Start recording data on matrix.
110 All questionnaires in hands of planning unit.
111 Start placing data into the computer.
112 Finish recording data on matrix.
113 Finish placing data into the computer.
114 Complete all computer manipulations.
115 Start analyzing and interpreting processed data.
116 Finish analyzing and interpreting processed data.
117 Write narrative description of analysis.
118 Publish narrative description of analysis.
119 Begin prioritization of programs based on resource inventory and constraints questionnaire data.
120 Begin writing objectives for each program.
121 Complete prioritization of programs.
122 Complete writing objectives for each program.

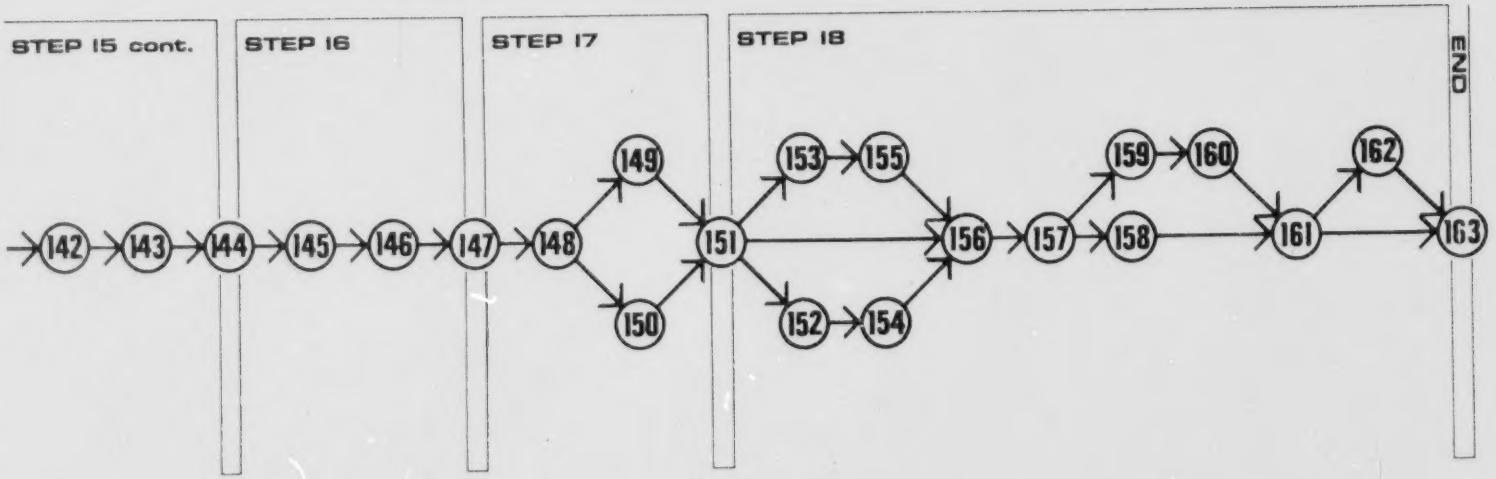
FIGURE 4 Continued

STEP 15



123 Review data from questionnaires four, five, and six.
124 Begin draft of workplan.
125 Write tentative statement of roles and responsibilities for TVA offices and divisions and external agencies and organizations.
126 Distribute tentative statements of roles and responsibilities to those from whom commitment is sought.
127 Recipients make reaction to tentative roles and responsibilities.
128 Begin preparation of modified statement of roles and responsibilities.
129 All comments on tentative roles and responsibilities returned to planning unit.
130 Complete modifications of roles and responsibilities statement.
131 Completed draft of workplan published.
132 Planning unit begins negotiations with TVA offices and divisions and outside agencies and organizations for roles and responsibilities.
133 Begin circulating sections of draft workplan to TVA offices and divisions and outside agencies and organizations for comment.
134 Complete negotiations with letters of agreement for roles and responsibilities.
135 All comments on draft workplan sections returned to planning unit.
136 Planning unit writes initial draft of full environmental education (EE) plan.
137 Initial draft of full EE plan sent to all those who signed letters of agreement for roles and responsibilities.
138 Those with roles and responsibilities write reactions and suggested changes in EE plan document.
139 Comments on EE plan document returned to planning unit.
140 Planning unit and advisory councils begin review of comments on EE plan.
141 Planning unit and advisory councils complete review of comments.

FIGURE 4 Continued



142 Begin preparation of final draft of full EE plan.
143 Complete preparation of final EE plan.
144 Publish final draft of full EE plan.
145 Submit final draft EE plan to TVA General Manager.
146 General Manager begins review of draft EE plan.
147 General Manager completes review of draft EE plan.
148 Draft EE plan with General Manager's comments and recommendations returned to planning unit and advisory councils.
149 General Manager notifies appropriate TVA offices and divisions of his decisions, comments, and recommendations.
150 Planning unit, through external advisory council, notifies external agencies and organizations of General Manager's reactions.
151 Designated offices and divisions and outside agencies and organizations begin first year implementation.
152 Begin measurements made of outcomes resulting from program implementation.
153 Begin repeat of situation assessment (events preceding steps three, four, and five above).
154 Complete measurement of program outcomes.
155 Complete situation assessment procedures.
156 Begin reevaluation of goals, program elements, resources and roles and responsibilities.
157 Complete reevaluation of goals, program elements, etc.
158 Begin preparation of recommendations for modifications and changes.
159 Begin consultation on recommendations with appropriate TVA offices and divisions and outside agencies and organizations.
160 Complete consultations on recommendations.
161 Complete preparation of recommendations for modifications and changes.
162 Submit recommendations to General Manager.
163 Completion of first year's implementation.

FIGURE 4 Continued

Step Two: Establish Internal and External Environmental Education Advisory Councils

Step Three: Develop Situation Assessment Questionnaires

Step Four: Conduct the Situation Assessment To Collect Baseline Data

Step Five: Analyze the Situation Assessment Data

Step Six: Develop TVA-Wide Environmental Education Goals

Step Seven: Develop a List of Program Descriptions Which May Be Undertaken To Achieve the Goals

Step Eight: Develop the Program Prioritization Questionnaire

Step Nine: Conduct the Program Prioritization Survey

Step Ten: Analyze the Program Prioritization Data

Step Eleven: Develop the Resource Inventory and Constraints Questionnaires

Step Twelve: Conduct the Resource Inventory and Constraints Survey

Step Thirteen: Analyze the Resource Inventory and Constraints Survey Data

Step Fourteen: Develop Measurable Program Objectives

Phase Two: Development of Environmental Education Plan

Step Fifteen: Develop Activities and Alternate Strategies For Accomplishing Objectives

Step Sixteen: Submit Final Draft of Environmental Education Plan to the General Manager

Phase Three: Implementation and Evaluation of the Environmental Education Plan

Step Seventeen: Implement the Environmental Education Plan as Approved by the General Manager

Step Eighteen: Evaluate Performance and Conduct Additional Situation Assessments

Phase and Step Description

Each of the phases and steps addresses four basic questions. What is to be done is expressed in the title of each phase and step. Who is to do it, how it is to be done, and when are outlined. A narrative discussion concludes each of the steps.

Phase One: Establishment of Program Objectives

Who: The TVA-wide planning unit (task force) appointed by the General Manager or the Director of Personnel

How: By accomplishing Steps One through Fourteen

When: From the beginning of the process to the end of the twelfth month

Step One: Formal Designation of TVA-Wide Environmental Education Planning Unit

Who: The General Manager of TVA or the Director of Personnel

How: By memorandum

When: At the beginning of the process

Discussion: In the process of this study, two very important elements became evident. The first element deals with the need for a planning unit to formulate, facilitate, and coordinate a total TVA-wide environmental education planning effort. Due to the interdisciplinary nature and broad scope of

environmental education, every office and division has a potentially significant role to play and, insofar as practical, each should contribute through its programs to a centrally coordinated effort. It is suggested that the General Manager or the Director of Personnel designate the planning unit, because the General Manager has TVA-wide responsibility while the Director of Personnel has responsibility for general education and planning. In either case, the planning unit should be responsible to one of the above. The unit should have access to advice from the advisory councils as provided for in Step Two.

For the purpose of this study, it is assumed that this planning unit consists of a task force and is therefore temporary in nature. When the final plan is completed (see Phase Three, page 62), it will be necessary to designate a permanent planning unit to assist in planning, coordinating, and managing the TVA environmental education program. However, it should be noted that this permanent planning unit could be designated at the beginning of the planning process in this step.

The second element in conjunction with the planning unit is for a full-time staff which also operates a clearinghouse. The clearinghouse provides a means for collecting, storing, retrieving, and disseminating baseline data, accurate information, and material pertinent to environmental information and education. Such a facility would greatly improve and maximize an effective communications system for TVA with regard to environmental education.

Step Two: Establish Internal and External Environmental Education Advisory Councils

Who: The internal advisory council should be appointed by the planning unit. The process for organizing the external advisory council should also be the responsibility of the planning unit.

How: The planning unit identifies individuals internally and externally who have indicated an interest in and/or expertise in environmentally oriented education. An invitation is then extended to a number of these people to serve in providing advice to the planning unit as needed.

When: By the end of the first month

Discussion: Although it may not be possible for every office and division within TVA to be represented on the planning unit, each should be given an opportunity to provide input into the planning process. The establishment of an internal advisory council affords this opportunity.

The citizenry at large, as well as those agencies having Federal, state, or local mandates for planning resource development, has a right to express its concerns and wishes before final plans are drafted. It is important to note that plans often fail when the people to be affected by them are not involved in the planning process. To formalize the inputs of local citizens, program receivers, etc., the planning unit should consider establishing an external environmental education advisory council or councils. This "grass roots" approach

will help TVA become more responsive to the needs and wants of the citizenry. Consideration should be given to establishing special external environmental education advisory councils in the TVA project impact areas.

Both the internal and external advisory councils would have the sole function of advising the planning unit about environmental concerns and environmental education needs and opportunities. It is important to note that along with the clearinghouse services, the advisory councils would also greatly improve and maximize an effective communications system for TVA with regard to environmental education.

Step Three: Develop Situation Assessment Questionnaires

Who: The planning unit and advisory councils

How: There are three substeps which must be taken to complete this third step. These substeps are listed below:

Substep A: Prepare a list of categories of information to be collected for the situation assessment procedure.

Substep B: Determine both the size and composition of the respondent group in order to achieve a stratified sample.

Substep C: Conduct a series of interviews with members of the advisory councils to collect statements based on the categories agreed upon in Substep A above and rank them according to the retranslation

method. For a detailed explanation of the retranslation method, see Appendix F.

When: Shortly after the advisory councils have been organized. It is anticipated that this would be completed by the end of the first month and one-half.

Discussion: In order to determine "where we are now," both internally and externally in environmental education, it is necessary to collect baseline data by conducting the situation assessment. This will require circulation of questionnaires within and outside TVA. Each questionnaire or set of questionnaires would include (1) space for the respondent to state his or her name, profession, and address; (2) the definition of environmental education for purposes of the situation assessment; and (3) special directions for completing the questionnaires. The planning unit would determine who (and how many individuals) should be approached to complete the questionnaires. In addition to TVA, respondents would be selected from the eight major categories listed in Appendix A.

Since the Federal Reports Act of 1942 requires that questionnaires be approved by the Office of Management and Budget, this method might pose a problem for TVA. If this is the case, since other agencies and organizations need the same data and can collect them, perhaps TVA could assist in preparation of the questionnaires and, in turn, share the data. At any rate, it is the philosophy of TVA to obtain the ideas of the citizenry before developing a program or project, and the situation

assessment should, therefore, be done in one form or another. By conducting a situation assessment, TVA will know the status of existing efforts, solicit interest on the part of a variety of people and their agencies and organizations in doing something about the environment through education, and have a prioritization of problems. The latter is very important since priorities will vary in different places within the Tennessee Valley region. In far too many cases, priorities are established by administrative fiat. What is needed is a logical, sequential, or systematic process which would result in a more meaningful list of priorities.

Appendixes G, H, and I include information for designing the questionnaires required for the situation assessment. These sample questionnaires contain material which could be used both inside and outside TVA. It is important to note that the sample questionnaires have been included only to show possible content and format and to provide information for the planners who would be conducting interviews and brainstorming sessions to gather more detailed and valid information. The specific sample questionnaires shown in the appendixes are briefly discussed in the following paragraphs.

Sample Questionnaire No. 1--What do you feel are the most urgent environmental concerns?

If the composite summation of all the concerns in this questionnaire shows that energy is the number one concern, TVA should then direct its resources accordingly.

Sample Questionnaire No. 2--What are the needs which must be met in order to make an environmental education program operational?

This listing of needs would be ranked in order of priority and then translated into program goals.

Sample Questionnaire No. 3--What types of environmental education or related services are you now providing, and what types are you interested in providing in view of your existing or projected resources?

The ranked order of priority and the composite summation of all items give the planners a good understanding of existing efforts and of resource availability both within and external to TVA. If the items are answered truthfully, and accurately, they will reveal such things as duplication of effort. Once a program service has been identified, the planners can always contact the respondent who completed the questionnaire to determine the exact nature of the service. When the findings are compared with the priorities in the other questionnaires, the planners will be able to make good preliminary decisions on resource allocation. They will also be helpful in formulating realistic goals because they will be based in part on the availability of deliverable services.

Use of the findings of this questionnaire as one of the bases for formulating goals enables the planners to relate these goals to the TVA mission, continuing objectives, and policies because it has been determined who is presently doing

what and who should be doing what according to their mandate. The findings could also be useful to the General Manager in redefining and assigning new roles within TVA.

Step Four: Conduct the Situation Assessment To Collect Baseline Data

Who: The planning unit circulates the questionnaires; the respondents are members of TVA offices and divisions and the eight categories listed in Appendix A.

How: By distributing and collecting questionnaires

When: By the end of the third month

Discussion: See Substep B and discussion section of Step Three, pages 48 and 49.

Step Five: Analyze the Situation Assessment Data

Who: The planning unit

How: By the data consolidation and analysis procedure matrix and computer

When: Immediately after receipt of completed questionnaires and by the end of the fourth month

Discussion: The data consolidation and analysis matrix is constructed along with the questionnaires. The matrix assists the planner to consolidate the data onto one sheet of paper, thereby facilitating the transfer of these data to a computer. The computer allows the planner to conduct a sophisticated analysis using a wide variety of variables and producing a very sophisticated set of results. This procedure is shown in Appendix J.

Step Six: Develop TVA-Wide Environmental Education Goals

Who: The planning unit and advisory councils

How: By translating the data from the questionnaire on environmental concerns, program needs, and services--present and future into overall TVA environmental education goals.

When: After the situation assessment data have been analyzed and by the end of the fifth month

Discussion: The goals should be the ends to be sought in addressing the environmental concerns, meeting the program needs, and utilizing the statements of services--present and future. Goals should give direction to the environmental education program, help set achievement parameters, and be used in developing objectives which are more specific ends. The objectives should be specific statements on what is to be accomplished.

Step Seven: Develop a List of Program Descriptions Which May Be Undertaken To Achieve the Goals

Who: The planning unit and advisory councils

How: By reviewing publications describing environmental education programs, matching program possibilities to goals, developing program descriptions based on the above, and utilizing experience of the planners and the data from the services--present and future questionnaire.

When: By the end of five and one-half months

Discussion: Based on a review of environmental education programs funded by the United States Office of Education (Department of Health, Education, and Welfare), cited in publications of the

Education Resources Information Center (ERIC), and listed in the state master plans for Colorado, Massachusetts, and Michigan, a comprehensive list of program possibilities is developed. Matching programs from the list with the goals developed in Step Six narrows the number of program possibilities relevant to TVA. The final questionnaire contains a list of short narrative statements which describe the basic kinds of programs or elements which could be undertaken. The content of these statements utilizes information from the sources cited above, ideas from the planning unit and advisory councils, and the data gained from the services--present and future questionnaire.

Step Eight: Develop the Program Prioritization Questionnaire

Who: Planning unit and advisory councils

How: This results directly from Steps Six and Seven.

When: By the end of the sixth month

Discussion: One questionnaire will be needed to determine programs to meet the goals. This questionnaire (No. 4) is shown in Appendix K and is discussed briefly in the following paragraphs.

Sample Questionnaire No. 4--Which of the following program elements do you believe would best ensure the achievement of the goals provided to you along with this questionnaire?

The respondents will be asked to choose from among individual programs within categories and to make some choices of program categories themselves.

Step Nine: Conduct the Program Prioritization Survey

Who: The planning unit distributes the questionnaire. Those who respond to Questionnaires 1 through 3, plus appropriate additions making up a stratified sample, will be respondents.

How: By distributing and collecting questionnaires

When: By the end of seven and one-half months

Discussion: The goals and the results of Questionnaire 4 will provide the planning unit (and eventually the General Manager) with data for making decisions about which programs will be recommended for implementation. Therefore, it is important that this survey reach a truly representative cross section (as in a stratified sample) of those to be served as well as those likely to be responsible for implementation.

Step Ten: Analyze the Program Prioritization Data

Who: The planning unit

How: By the data consolidation and analysis procedure matrix and possibly the computer

When: Immediately after receipt of the completed questionnaires and by the end of the eighth month

Discussion: The procedures for this step are described in the discussion under Step Five, page 52.

Step Eleven: Develop the Resource Inventory and Constraints Questionnaires

Who: The planning unit and advisory councils

How: There are two substeps which must be taken to complete this eleventh step. These two substeps are listed below:

Substep A: Given the results and interpretations of the program possibilities questionnaire and the services--present and future inventory, the planners design the resource inventory questionnaire and select the respondents.

Substep B: A comprehensive list of constraints is developed based on the experience and critical observations of members of the planning unit and advisory councils. This list is used in the design of the constraints questionnaire. The constraints questionnaire contains provisions for responses reflecting internal (TVA) and external views.

When: Both questionnaires will be completed simultaneously by the end of the ninth month.

Discussion: The results gained from Questionnaire 4 which prioritizes the programs and decisions by the planning unit and the advisory councils form a foundation for the resource inventory questionnaire. A full range of programs which would best meet the goals is listed. Following the statement of each program will be a set of questions about the resources needed to meet that specific program. This might make the inventory questions for each program or element a little different. Some of the items which could go into a resource inventory questionnaire are shown in Appendix L.

The contents of the constraints questionnaire are based largely on the experience of the planning unit gained while working through all of the previous steps to this point. The advisory councils' experience or work with environmental education inside and outside TVA is a second important source of constraints information. The actual development of the questionnaire involves the production of a set of concise statements describing one at a time the possible constraints to planning, implementing, and operating environmental education programs. Provisions are made in the questionnaire for an assessment of constraints which exist both internally and externally. Some of the items which could go into a constraints questionnaire are shown in Appendix M.

Sample Questionnaires 5 and 6 are discussed briefly in the following paragraphs.

Sample Questionnaire No. 5--Which of the following resources does your organization have which could contribute to the program or program elements listed below?

The respondents would be asked to provide information about the types of resources which they have at their disposal for accomplishing a specific program, program element, or group of program elements. This would include information about personnel, money, material, facilities, etc.

Sample Questionnaire No. 6--What are the constraints to planning, implementing, and operating the environmental

education programs or elements listed in the resource inventory questionnaire?

This will provide useful information for developing specific program objectives and special strategies to overcome the most prevalent constraints and to ensure efficient operation of the basic TVA program.

Step Twelve: Conduct the Resource Inventory and Constraints Survey

Who: The planning unit

How: By distributing questionnaires to be completed and returned to the planning unit

When: Both surveys will be conducted simultaneously by the end of ten and one-half months.

Discussion: The resource inventory and the constraints survey are conducted in the same manner as the situation assessment described in Step Four. However, a new sample group of respondents may be appropriate for this inventory. Respondents would be selected from within TVA and from the eight major categories listed in Appendix A. Special attention should be given to those who in Questionnaires 3 and 4 indicated an interest in activities similar to those appearing in this inventory.

Step Thirteen: Analyze the Resource Inventory and Constraints Survey Data

Who: The planning unit and advisory councils

How: By the data consolidation and analysis procedure matrix and computer (see Step Five, page 52, and Appendix J).

When: Immediately after receipt of the completed questionnaires and by the end of the eleventh month

Discussion: The availability of resources must be determined for each of the programs or elements. Those programs having abundant resources thereby become more feasible and probably have a higher priority than some of the other programs. Those programs for which resources are not readily available and which are not critical to the achievement of the goals will probably be placed at a lower priority. Those programs for which resources are not readily available but which are critical for the achievement of the goals will receive a high priority in terms of future allocation or reallocation of resources.

An analysis of the constraints survey data should be used to determine the type of constraints, their location inside and outside TVA, and to make comparisons of the relative importance of one to the other. The result of the analysis must be data in a form which can be used to help build strategies to overcome the constraints.

Step Fourteen: Develop Measurable Program Objectives

Who: The planning unit and advisory councils

How: By determining and describing the expected outcome of the various programs

When: By the end of the twelfth month

Discussion: Before writing objectives the planners must re-prioritize the program possibilities based on the data received in the resource inventory and constraints questionnaires.

That is, a program which received a high priority ranking as a result of the questionnaire analysis in Step Ten may have very few resources available and have as its number one constraint an inability to get money. In this case, this program would have to be given a lower priority.

Objectives must be written which are quantifiable, capable of attainment, and have a performance measure associated with them.

Phase Two: Development of Environmental Education Plan

Who: Primarily the planning unit, planners from offices and divisions with specific program responsibilities, the internal advisory council, and the external advisory council when appropriate

How: By accomplishing Steps Fifteen and Sixteen

When: From the twelfth month to the end of the eighteenth month

Step Fifteen: Develop Activities and Alternate Strategies For Accomplishing Objectives

Who: Primarily the planning unit, planners from offices and divisions with specific program responsibilities, and the internal advisory council

How: By using the results of Questionnaires 4, 5, and 6 and decisions made by the planning unit

When: By the end of the fifteenth month

Discussion: Essentially this document will be a workplan or series of workplans. These workplans would be designed to dovetail

into the TVA management system for planning, coordinating, controlling, evaluating, and reporting work. Each of the programs selected from those in Questionnaire 4 will be fully developed with objectives, activities, strategies, schedule, budget, and evaluation plan. In addition, specific recommendations will be stated as to how each of these programs can be carried out. All of the work in this step takes into account the appropriate psychology of learning, educational technology, etc. The strategies for overcoming the constraints (as determined from the analysis in Step Thirteen) and the results of the resource inventory data are also incorporated in the work of this step as appropriate.

Another important aspect of this step is the set of recommendations assigning the various roles and responsibilities required. The expected result of these recommendations is the assignment--and acceptance--of responsibilities to play some role in designing or implementing a specific program or element. It is anticipated that these assignments would be made to specific TVA offices and divisions. Suggested assignments may also be made to appropriate organizations and agencies outside of TVA.

The internal and external advisory councils will be given an opportunity to review the workplan or plans. This will facilitate a better understanding of the total environmental education program by all concerned. The planning unit should secure letters of agreement or commitment concerning

implementation of specific programs from TVA offices and divisions and in some cases external agencies.

Step Sixteen: Submit Final Draft Environmental Education Plan to General Manager

Who: Director of Personnel

How: The plan will be sent to the Director of Personnel and eventually to the General Manager.

When: By the end of the eighteenth month

Discussion: The plan would include detailed recommendations for the TVA role. Because of the extensive use of questionnaires and surveys, abundant data will be available to those making decisions about assignments of responsibilities. This includes recommended roles and responsibilities, statements of interests, and resources available for environmental education program development.

Phase Three: Implementation and Evaluation of the Environmental Education Plan

Who: Coordinated by a formal, permanent, central environmental education planning unit within TVA and implemented by staffs of offices and divisions

How: By means deemed necessary by the General Manager and as indicated in the plan to complete Steps Seventeen and Eighteen

When: From the eighteenth month until the operational program is established

Step Seventeen: Implement the Environmental Education Plan as Approved by the General Manager

Who: The central environmental education planning unit and appropriate offices and divisions

How: Continuation of existing programs, rearrangement of priorities, modification of existing programs, and establishment of new programs

When: Begin by the end of the eighteenth month

Discussion: The plan provides detailed guidance for implementing the various programs which are to be assigned by the General Manager to the appropriate offices and divisions.

Step Eighteen: Evaluate Performance and Conduct Additional Situation Assessments

Who: The central environmental education planning unit, appropriate offices and divisions, and advisory councils as needed

How: By evaluation schemes outlined in the plan and carried out by the implement rs as well as additional continuous situation assessment similar to that used initially as in Steps Three through Five. Results of this assessment as well as of implementation will be used to reevaluate goals, program elements, resources, roles, and responsibilities and to make appropriate modifications, including cancellation of program elements if so indicated.

When: At the completion of any specific program or project and at least yearly beginning by the end of the thirtieth month

Discussion: Evaluation will aid in holding the efforts accountable for the achievement of outcomes in a cost-effective manner. In addition, evaluation data can be fed back to the program planners or implementors to be used in making decisions about continuation, modification, or termination of programs or activities.

It is necessary to keep abreast of the continuously changing program needs. One must also keep abreast of the changing environmental conditions and the services available or proposed as these heavily influence the environmental education goals developed from the program needs. Needs may also change as a result of the successes or failures of the programs undertaken.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The original Act creating TVA provided for involvement in educational experimentation, and the agency has been providing some environmental education or related services since its inception. Such services to educational institutions or organizations in the Tennessee Valley region have included provision of (1) technical assistance; (2) environmental data, resource information, and related instructional material; (3) learning opportunities at some of its facilities; and (4) financial support for demonstrations or experiments in environmental education.

At the time of this study, no central, formal plan existed for a TVA-wide environmental education program. As a result, there were communication problems, fragmentation, overlap, duplication of efforts, and inefficient use of human, fiscal, and other resources. A review of the literature failed to reveal any published documents on planning processes for comprehensive, problem-focused environmental education programs which could be applied effectively to TVA. Therefore, a special process had to be developed to fit the TVA situation. The writer began by preparing a list of questions concerning environmental

education planning. These questions were then posed to a few selected professional and nonprofessional individuals from a variety of agencies, organizations, groups, etc. The answers to the questions, in some cases the questions themselves, and the writer's experience were used in designing a process model incorporating the system approach to fit the TVA situation.

The purpose of the study, then, was to develop a process model which, if implemented, would permit TVA to enhance its internal environmental education capabilities as well as utilize its resources more effectively when working with other Federal, state, and local agencies and groups in improving environmental quality and the quality of formal and informal education as it pertained to the environment.

The process model consisted of three planning phases which were further broken down into steps and substeps where appropriate. Phase I dealt with the establishment of program objectives which are arrived at through conducting a situation assessment and resource inventory. Sample questionnaires were prepared for conducting the situation assessment and resource inventory. Phase II dealt with the development of the environmental education plan, which is basically a workplan or series of workplans which includes activities and strategies for accomplishing the objectives. Phase III dealt with implementation of the environmental education plan as approved by the General Manager. It also dealt with evaluating performance and conducting additional situation assessments.

Conclusions

The environmental quality of the region depends largely upon the environmental education received by the citizenry. In view of its mission and resources, TVA has a very significant role in providing quality environmental education programs and services. The agency is concerned with the total environment--its physical, biological, social, cultural, economic, aesthetic, and political attributes. It seems logical that the first step in planning a comprehensive approach to environmental education would be implementation of the process model.

The major advantages of implementing the process model are listed as follows:

1. It provides the framework or guidelines for developing a formal, comprehensive, coordinated, long-range environmental education plan of action for directing change in the Tennessee Valley region.
2. It provides a mechanism for TVA to initiate and maintain a successful dialogue among employees of the agency, employees of other agencies concerned with environmental education, and the people at the "grass roots" level who will be affected by the plan.
3. It provides individuals from many organizations and walks of life--decision makers, politicians, and the general citizenry--the opportunity to express their needs and wants and to prioritize them.
4. It provides a systematic process for identifying the major environmental concerns, constraints to program development,

needs, goals, program possibilities, priorities, and resources available.

5. It provides for an organizational structure (planning unit) which can improve liaison and communications and provide coordination and leadership for the TVA ongoing environmental education effort.
6. It provides a process whereby TVA or other similarly organized agencies can develop a flexible master plan--one that can be periodically modified and revised according to changing needs and priorities.
7. It provides a mechanism for evaluation--that is, determining whether the objectives have been accomplished and to what extent change has occurred over a period of time as a result of the plan or program.
8. It provides an efficient method of determining real needs and priorities and of allocating or reallocating scarce human and fiscal resources.

Recommendations

The study validated the need for a planning process or systematic method for TVA to use in implementing a comprehensive environmental education program involving all of its offices and divisions, as well as the major external entities concerned. The lack of an agency-wide planning strategy and an entity responsible for tying the many elements of an environmental education program together has caused problems which are affecting TVA's credibility, policy, and methods of operation. Therefore, it is highly recommended that TVA implement the process

model. In doing so, it is recommended that the following steps be taken:

1. That an environmental education program be established within TVA on a formal basis which includes internal training for employees as well as external services to educational institutions, organizations, and groups.
2. That a central planning unit be appointed by the General Manager or the Director of Personnel to formulate, facilitate, coordinate, and provide leadership in a total TVA-wide environmental education effort for the Valley region.
3. That as many people as practical within TVA and outside at the "grass roots" level be actively involved in the environmental education planning process either by serving on an advisory council, answering questionnaires, or by participating in the programs implemented. TVA should direct services to (1) urban areas, (2) suburban areas, and (3) rural areas, in that order (except in special cases at its project impact areas).
4. That cooperative working relationships be established with agencies, organizations, foundations, and groups concerned with environmental education program development.
5. That TVA encourage application of the process model by other kinds of agencies. Agencies with different missions and of different sizes in terms of constituency and geography should test the model. In this way the full breadth and scope of the model will be pragmatically determined.

6. That accurate, relevant baseline data be collected on environmental problems and resources in the Valley region and used to develop an environmental quality index to measure whether the quality of the environment has worsened or improved on an annual basis. A continuing determination of the quality of environmental education may be made by the manner in which the environmental quality index improves as a result of actions taken by the educated public.

APPENDIXES

APPENDIX A

CATEGORIES OF RESPONDENTS

CATEGORIES OF RESPONDENTS

Respondents to the situation assessment and resource inventory questionnaires should be selected from eight major categories: (1) government (Federal and state); (2) educational institutions or organizations; (3) professional organizations, foundations, interest groups, and citizens' groups; (4) mass media; (5) labor organizations; (6) business and industry; (7) religious organizations; and (8) youth organizations. A listing of some of the agencies, organizations, and groups within the above categories follows:

1. Government (Federal and State)

   Federal

   Council for Environmental Quality
   Environmental Protection Agency
   Department of Health, Education, and Welfare
   (Office of Education)
   Department of the Interior
   Department of Agriculture
   Department of Housing and Urban Development
   Department of Transportation
   National Aeronautics and Space Administration
   National Science Foundation
   Atomic Energy Commission
   Appalachian Regional Commission
   Others

State

Departments of Education
Departments of Health
Departments of Conservation
Departments of Transportation
Departments of Agriculture
Game and Fish Commissions
Planning Offices and Commissions
Development Districts
Watershed Development Associations
Others

2. Educational Institutions or Organizations

Schools, Colleges, and Universities
Educational Cooperatives
Environmental Education, Nature, and Interpretive Centers
Others

3. Professional Organizations, Foundations, Interest Groups, and Citizens' Groups

Alliance for Environmental Education
National Association for Environmental Education
National Education Association
State Education Associations
American Association for the Advancement of Science
Rockefeller Brothers Fund
W. K. Kellogg Foundation
National Endowment for the Humanities
Resources for the Future, Inc.
The Ford Foundation
American Conservation Association, Inc.
The Conservation Foundation
Sierra Club
National Audubon Society
The National Wildlife Federation
Environmental Defense Fund, Inc.
Friends of the Earth
State Conservation Councils, Environmental Councils, Conservation Leagues, Wildlife Federations, Sportsmen's Clubs
State Associations for Health, Physical Education, and Recreation
Junior League, Rotary, Kiwanis, League of Women Voters
Others

4. Mass Media

Alabama Broadcasters Association
Georgia Association of Broadcasters
Kentucky Broadcasters Association
Mississippi Broadcasters Association
North Carolina Association of Broadcasters
Tennessee Association of Broadcasters
Virginia Association of Broadcasters
Associated Press
United Press International
Alabama Press Association
Georgia Press Association
Kentucky Press Association
Mississippi Press Association
North Carolina Press Association
Tennessee Press Association
Virginia Press Association
Others

5. Labor Organizations

American Federation of Labor-Congress of Industrial Organizations
International Brotherhood of Electrical Workers
United Association of Journeymen and Apprentices of Plumbing and Pipe Fitting Industry of the United States and Canada
International Union of Operating Engineers
Laborers' International Union of North America
Textile Workers Union of America
United Steel Workers of America
International Association of Machinists and Aerospace Workers
Others

6. Business and Industry

Aluminum Company of America
Tennessee Eastman Company
Radio Corporation of America
Ford Motor Company
Union Carbide Corporation
International Telephone and Telegraph
Telecommunications
Others

7. Religious Organizations

State Councils of Churches
Commission on Religion in Appalachia
American Baptist Convention
American Lutheran Church
Catholic Church
Christian Church
Christian Church (Disciples of Christ)
Church of God
Church of the Brethern
Episcopal Church
Friends United Meeting
Home Mission Board of the Southern Baptist Convention (SBC)
Lutheran Church in America
Lutheran Church--Missouri Synod
Others

8. Youth Organizations

Young Women's Christian Association
Young Men's Christian Association
Boy Scouts of America
Girl Scouts of the U.S.A.
Others

NOTE: The planning process is an educational program in itself, and therefore it is important to actively involve as many people in the Tennessee Valley region as possible. Some of the above agencies, etc., either have environmental education or related programs underway or will plan and implement them in the future. It is imperative that TVA develop effective working relationships with these agencies in order to avoid duplication of effort and other problems.

APPENDIX B

STATEMENT OF TVA MISSION AND CONTINUING OBJECTIVES

STATEMENT OF TVA MISSION AND CONTINUING OBJECTIVES

TVA Mission

To use TVA's unique corporate and governmental powers to foster the social, economic, and environmental progress of the people of the region and the Nation through a unified approach to resource development, employing the application and advancement of technology, innovation, and planned change.

TVA's Continuing Objectives

1. The Natural Resource Objective: to develop, conserve, and utilize the region's physical resources so as to foster a better quality of life.
2. The Power Resource Objective: to improve the quality of life in the region through provision of an adequate regional power supply on a sound financial basis.
3. The Institutional Resources Objective: to enhance the capabilities of the region's public and private institutional resources to provide the services and opportunities necessary for a better quality of life.

4. The Human Resource Development Objective: to assist in the development and utilization of human resources in the region, including especially agency employees.

5. The Agricultural Development Objective: to meet the national need for low-cost, effectively used fertilizers and to further the well-being of agricultural and related enterprises in the Valley.

6. The National Defense and International Assistance Objective: to provide requested support for defense and international assistance programs of the Nation.

7. The Agency Image Objective: to establish and maintain general public interest and confidence in the agency through an overall high-quality level of performance.[35]

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[35]David A. Patterson, "Revised Statements of TVA Mission and Continuing Objectives," an official memorandum to offices and divisions of TVA, November 24, 1971.

APPENDIX C

LETTER SENT TO PANEL OF EXPERTS SEEKING VALIDATION OF THE PROCESS MODEL

TENNESSEE VALLEY AUTHORITY
KNOXVILLE, TENNESSEE
37902

TVA 40TH ANNIVERSARY OF PEOPLE IN PARTNERSHIP

October 17, 1973

Dear

I have chosen you as an experienced planner to be a member of a panel of experts to evaluate the process model for environmental education presented in my dissertation. The dissertation is titled "A Process Model Showing How a Federal Government Agency, Such as the Tennessee Valley Authority, Can Utilize its Resources To Cooperate With Other Agencies in the Development of Environmental Education Programs for the Tennessee Valley Region."

Would you please read and evaluate the model as to its applicability to environmental education planning in the situations with which you have worked, e.g., those at Federal, state, and/or local level. I would appreciate receiving your comments by November 15. If you have any questions, please call me at (615) 637-0101, ext. 2102.

Thank you for your consideration.

Sincerely yours,

Jonathan M. Wert
Environmental Education Specialist
Division of Personnel

APPENDIX D

LETTERS FROM PANEL OF EXPERTS VALIDATING THE PROCESS MODEL

BOARD OF EDUCATION
MR. ROBERT E. LEE, President
MRS. JEANNE ATKINSON
MR. RICHARD F. BAILEY
MR. DOYLE BURDINE
MR. W. E. RINO III

SUPERINTENDENT OF SCHOOLS
DR. RALPH E. EVANS

SECRETARY TO THE SUPERINTENDENT
MRS. GENETTE SNAPP

ASSISTANT SUPERINTENDENT
DR. ROBERT M. ELLIOTT

KINGSPORT CITY SCHOOLS

1701 EAST CENTER STREET
PHONE 615—245-3153
KINGSPORT, TENNESSEE 37664

DIRECTOR OF MAINTENANCE, PROCUREMENT, AND TRANSPORTATION
MR. THOMAS J. HILL

DIRECTOR OF SPECIAL PROGRAMS AND ATTENDANCE SERVICES
MRS. WANDA N. BLEDSOE

SUPERVISOR OF INSTRUCTION
MR. KENNETH C. THORNTON

COORDINATOR OF FINE ARTS
MR. PAUL ARRINGTON

DIRECTOR OF HEALTH, PHYSICAL EDUCATION AND ATHLETICS
MR. THOMAS D. BRIXEY

DIRECTOR OF CAFETERIAS
MRS. FRANCIS SANDERS

November 1, 1973

Mr. Jonathan Wert
Environmental Education Specialist
Educations Relations and
Manpower Development Staff
Tennessee Valley Authority
Knoxville, Tennessee 37902

RECEIVED
NOV 5 1973
EDUCATION AND MANPOWER DEVELOPMENT

Dear Mr. Wert:

I appreciate you giving me the opportunity to review your doctoral dissertation which describes a process for planning and implementing a comprehensive, problem-focused environmental education program for the Tennessee Valley Authority.

As you know, my four years of experience in environmental education planning has been at the local level here with the City of Kingsport school system. In light of this experience, I have reviewed your process model thoroughly and have the following comments.

First, a big stumbling block to effective environmental education planning and program implementation is in knowing how to get organized, what to do, how to do it, who should be involved or do the work, within what time span should the work be done, and how much is it going to cost. Your process model presents a logical and practical systems approach which can easily be modified and applied to a local school system. I can therefore use it in my work.

Second, I was pleased to see the comprehensive sample questionnaires which you developed for the program planners to use as a guide when conducting brainstorming sessions with advisory council members to obtain more valid material for the final questionnaires. Because of your broad experience at all geographic levels (local, state, and regional), I believe the sample questionnaires include just about all the possibilities. It will certainly be interesting to see how the sample questionnaires differ from those which will be developed through implementing the process model. Although the questionnaire process requires a lot of work, whether the questions are asked during personal interviews or simply mailed to respondents, I think this is the best procedure in the long run. Planners must have the answers to the questions in the questionnaires in order to develop a comprehensive work plan or master planning document for environmental education. I especially like the methodology for determining real

priorities at the grass roots level, getting commitments from those agencies or groups having resources and program responsibilities, and use of the situation assessment questionnaires to evaluate the overall agency-wide program on an annual basis.

Third, I like the way the process model is designed and presented in understandable terms. It is general enough to allow for flexibilities, yet it is specific enough to let both planner and laymen know just what has to be done to accomplish the work.

Fourth, the process model, if implemented by a variety of agencies or groups at different geographic levels, will help to set the parameters of environmental education. This is badly needed and to the best of my knowledge has never been done.

In summary, I hope the process model will be field tested at all levels. I think it should be disseminated widely to other federal agencies, state departments of education not having master plans, to educational cooperatives, development districts, planning commissions, school systems, etc. TVA is fortunate to have such a plan of action, and implementing it would certainly help people develop a new confidence in an agency which was once known all over the world as the leader in conservation. I believe your plan is the kind of thing the late President Franklin D. Roosevelt and the other creators of TVA had in mind for the agency in the first place.

Sincerely,

Ronald B. Childress

Ronald B. Childress
Environmental Education Coordinator

gj

University City Science Center
3508 Science Center
Philadelphia
Pennsylvania 19104
215 EV 7-2255

RECEIVED
OCT 29 1973
EDUCATION AND
MANPOWER DEVELOPMENT

October 24, 1973

Mr. Jonathan M. Wert
Environmental Education Specialist
Division of Personnel
Tennessee Valley Authority
Knoxville, Tennessee 37902

Dear Jon:

It was a pleasure to receive and review your dissertation entitled "A Process Model Showing How a Federal Government Agency, such as the Tennessee Valley Authority, can Utilize its Resources to Cooperate with Other Agencies in the Development of Environmental Education Programs for the Tennessee Valley Region." You certainly have put a great deal of effort into this study.

I am most impressed with the comprehensive nature of your process model. Although it is developed around the actuality of TVA, the framework lends itself to application at several levels. Federal (national) efforts I participate in, such as Office of Environmental Education (OEE) in HEW and a national network under the auspices of the Institute for Environmental Education certainly could adopt the model for use. In terms of state planning, your phase sequence is as comprehensive as any I have dealt with in Pennsylvania, the Center for Research and Education effort in Colorado, and the recent national planning conference at Estes Park in the spring of 1973.

Several facets of your study bear mentioning because of their practical value. I often note critical phases in the consulting work I do and I try hard to minimize risks for planners and volunteers in "open processes." Your study presents several things which will tend to minimize risks. It presents a comprehensive framework: the user will know he is following a route by design not hunch. At several points the work is divided; no one has to "do it all" or "know it all." This should be a comfort to volunteers who fear beginning something because of demands to be on top of everything.

In particular, your development of the eight component elements which utilize the process model is the most comprehensive I have seen. On a local basis, where a lot is going on at present, your dissertation is perhaps a major key to future progress. Local efforts will be frustrated ultimately if each local effort is not able to relate to another local effort. Fortunately, the publication of your dissertation will partially remedy the local dilemma.

Your process model may be applied broadly. I can readily see how I could use it as an assessment device at the beginning of a consultation series in two ways: first, to determine where chronologically the subject system is, and secondly, to determine if any component elements are missing and need to be established to fill in the framework.

The study also introduces various benefit-to-cost possibilities by allowing flexibility in who does what and whether or not volunteers may be used. This is augmented by the time-from-start sequence references which allow partially completed programs to be tailored to the phase sequence easily.

It has been a pleasure to review your study, and I look forward to its early publication because it is a tool I can use in my work; I'm sure it will be well received by others.

Ecologically,

Jack

John T. Hershey
Manager, Environmental Programs

JTH/vgy

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NOV 28 1973
EDUCATION AND
MANPOWER DEVELOPMENT

THE APPALACHIAN REGIONAL COMMISSION
1666 CONNECTICUT AVENUE
WASHINGTON, D.C. 20235

November 26, 1973

Mr. Jonathan M. Wert
Environmental Education
Specialist
Tennessee Valley Authority
Knoxville, Tennessee 37902

Dear Mr. Wert:

Both Hugh Montgomery, the Commission's specialist on the environment, and I have read your proposed model for establishing a process approach for environmental education in the Tennessee Valley Authority.

Quite frankly, both of us feel that this approach is reasonable and feasible and could be replicated quite easily in Appalachia. We hope that you will be able to proceed quickly and efficiently.

Please feel free to call on us for any assistance on this project.

Sincerely,

Hugh B. Montgomery

H. Montgomery
Environment Consultant

H. Morse
Senior Policy Advisor
Education

STATE OF TENNESSEE
DEPARTMENT OF EDUCATION
Division of Field Services and Resources
104 CORDELL HULL BUILDING
NASHVILLE, TENNESSEE 37219

November 14, 1973

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NOV 15 1973
EDUCATION AND
MANPOWER DEVELOPMENT

Mr. Jonathan M. Wert
Environmental Education Specialist
Division of Personnel
Tennessee Valley Authority
300 - FH
Knoxville, Tennessee 37902

Dear Jon:

The development of sound environmental education has been limited by the lack of models for program development. Although an analysis of several existing master plans will reveal some similar outcomes, there has been a duplication of manpower in arriving at the final plans now completed by several states.

Your dissertation, "A Process Model Showing How A Federal Government Agency, Such as The Tennessee Valley Authority, Can Utilize Its Resources To Cooperate With Other Agencies In the Development of Environmental Education Programs for the Tennessee Valley Region", represents an outstanding effort to identify and design a system for developing environmental education programs. This model has utility for many agencies and organizations at the local, state, and national level who are concerned with organizing environmental education programs.

If possible, I would like to have a copy of your dissertation for use in the further development and implementation of the Tennessee Master Plan for Environmental Education.

As coordinator of environmental education programs for the Department of Education I am always interested in efforts in this area. I appreciate your cooperation in sharing your work with us as we seek to improve our environment.

Sincerely,

R. Jerry Rice

R. Jerry Rice
Science Specialist

RJR:ph

November 21, 1973

RECEIVED
NOV 26 1973
EDUCATION AND
MANPOWER DEVELOPMENT

Mr. Jonathan Wert
Environmental Education Specialist
Division of Personnel
Tennessee Valley Authority
Knoxville, Tennessee 37902

Dear Jon:

I have received and read your dissertation entitled "A Process Model Showing How A Federal Government Agency Such as the Tennessee Valley Authority Can Utilize Its Resources to Cooperate with Other Agencies in the Development of Environmental Education Programs for the Tennessee Valley Region."

I was flattered by your reference to me as an expert; I was equally exasperated by the length of the title. I will do my best to live up to your expectations of my expertise and I understand that long titles simply go with dissertations.

You asked me to evaluate the dissertation in terms of its applicability to statewide environmental education planning in accordance with my own experience. I have tried to organize my responses accordingly.

First some general comments. I find the document both useful and practical. Most of my work is in applying ideas and I have found most dissertation work too theoretical and esoteric to be of much applicable use. This document is neither.

I found the work personally helpful. It caused me to rethink some of what I do. I believe its usefulness to the practitioner is its real strength. It has good internal organization, contains useful graphics, and the example forms are particularly helpful. It also conforms to my own experience and bias in terms of the direction it takes a planner and the steps it proposes be employed.

The dissertation is very timely with respect to governmental agencies, especially those at the federal level. Government agencies are now trying to do more planning with the participation of citizens and

cre CENTER FOR RESEARCH AND EDUCATION— 2010 E. 17TH AVENUE — DENVER, COLORADO 80206
PHONE (303) 388-8311 CABLE CREDEN

other government personnel, but these agencies have little experience or know-how. Your work makes an excellent case for governmental agencies involving citizens and others, and is mildly critical of those who do not. At the same time it is a good critic since it provides tools and processes needed to address this problem.

Government is also being forced into greater multi-agency cooperation, however, their history is that of self-centeredness. You have made a good case for interagency cooperation, making a number of specific points about both its usefulness and its benefits. Here too, you adequately describe what can be done to pull this off.

Another point you cover reasonably well is the need for additional governmental concern for the environment and the need for governmental re-examination of what they do in light of its value as education. You explain well what both environment and education together entail and explain reasonably well what is required by agencies interested in pursuing work in this area.

While your document makes specific reference to a federal agency it has usefulness for those working at all governmental levels. However, you have not covered any of the special problems of those not working for TVA. In some cases people will not be able to transfer ideas from one situation to another. This is not serious but as a working guide this could present problems.

A similar strength and weakness is the document's usefulness as a tool for private citizens desiring to work more closely with governmental agencies. You have provided some helpful general information for those of the public willing to take responsibility for involvement but don't have the know-how. The document will have the most value for the individual planning practitioner. The situation within which the planner works is important in light of the weakness discussed above, but as a general guide it will be helpful to anyone.

The feature of the dissertation I like best is the emphasis on involvement and participation. We both know environmental education is penniless and often lacks other obvious job related pay-offs with which to entice the large number of people who ultimately must be involved in implementing various aspects of environmental education. Thus, not having a way to buy the cooperation and involvement of others, your dissertation attacks it from the other end. It proposes ways to involve people in the formulation of the plans and for addressing the proposed projects to the specific needs, concerns, and resources of those from whom we desire help. In short, you have made a big step toward their self-interest and gaining their long-range commitment. The essence of any process model is the extent to which a broad base of participation is

accommodated. I think your document speaks well to this process. It provides the tools and procedures necessary for those interested in this approach, even those outside of environmental education who must employ such a process to get their projects under way.

From a purely practical point of view, the real evaluation of your dissertation rests upon whether or not someone can actually do what you have proposed and the success or failure of its implementation. I hope so, as I don't know of any examples where what you propose has actually been done. The time is ripe and you have the blueprint. If it works, and I predict it will, then it was a good blueprint.

I look forward to hearing from you about what TVA intends to do with your plans. Keep me posted as to how things go. If you have any additional questions, please feel free to call.

Sincerely,

Richard Rocchio

Richard Rocchio
Associate Director

RR/jm

APPENDIX E

TVA ORGANIZATIONAL STRUCTURE
AND
FUNCTIONS OF OFFICES AND DIVISIONS

TVA ORGANIZATIONAL STRUCTURE
AND
FUNCTIONS OF OFFICES AND DIVISIONS

The following material taken from the TVA Organization Bulletin briefly describes the organization and functions of offices and divisions:

The Board of Directors, under the TVA Act, is vested with all the powers of the Corporation. The Board establishes general policies and programs; reviews and appraises progress and results; approves projects and specific items which are of major importance, involve important external relations, or otherwise require Board approval; approves the annual budget; and establishes the basic organization through which programs and policies are executed.

The General Counsel advises the Board on legal matters. He, or the representative he designates to act in his absence, serves as Secretary to the Corporation.

The General Manager is the principal TVA administrative officer. He serves as liaison between the Board and the offices and divisions in the handling of matters of Board concern, and is responsible for coordinating the execution of programs, policies, and decisions which the Board of Directors approves or adopts. He brings before the Board matters which require its consideration or approval; assists the Board in presenting the TVA budget to the Office of Management and Budget and to Congress; affirms to the Board the adequacy of staff coordination and contribution in matters presented for its consideration, including judgments relating to broad public consequences, social and economic effects, and planning and program direction; interprets the Board's instructions to the offices and divisions; originates or approves administrative controls to ensure integrated execution of the total TVA program; and reports to the Board on overall efficiency, effectiveness, and economy of TVA operations.

The General Manager assigns duties and makes delegations to the TVA offices, divisions, and staffs in their execution of programs and policies which the Board of Directors adopts, subject to such controls as it may establish. He reviews and approves major TVA management methods, major organization changes within offices and divisions, and major staff appointments, and recommends to the Board basic changes in the TVA organization. He is responsible for ensuring that appropriate matters are presented in coordinated form to the Board at the proper time and that the Board has pertinent related information. He provides for the formal definition and communication of TVA programs, policies, procedures, and continuing delegations of authority and responsibility.

The Office of the General Manager includes the Planning Staff, the Budget Staff, the Information Office, the Equal Employment Opportunity Staff, the Washington Office, the Power Financing Officer, and such other assistants as the General Manager may require to perform specialized duties or to aid him in expediting, coordinating, and disposing of current business. . . .

The Division of Finance formulates, recommends, administers, and evaluates policies related to accounting, auditing, financial reporting, and the handling of TVA funds; establishes systems of accounting and internal control, including accounting controls over TVA property and other assets; develops related instructions and procedures; and advises and assists on matters pertaining to these functions. It performs accounting and administrative work for the TVA Retirement System.

The Division of Law handles all litigation, legal proceedings, claims, and other legal problems relating to TVA's activities; advises and assists on legislative matters in which TVA has an interest; gives legal advice, opinions, and assistance; and prepares or approves and construes all documents affecting TVA's legal relationships.

The Division of Personnel formulates, recommends, administers, and evaluates policies in the field of personnel administration, including those related to recruitment, selection, classification, compensation, and training of personnel, union-management relations, organization, administrative relations, personnel management information, and related aspects of personnel administration; conducts negotiations with unions representing employees; develops personnel standards and procedures; and advises and assists in the handling and execution of matters and actions related to TVA personnel administration.

The Division of Property and Supply formulates, recommends, administers, and evaluates policies related to the acquisition, transfer, and disposal of real property and to the provision of

computing services, transportation services, and office services, and analyses of office methods; and develops related standards and procedures and advises and assists in their application and use.

The Division of Purchasing formulates, recommends, administers, and evaluates policies relating to the procurement, shipping, transfer, and disposal of equipment, materials, supplies, and services, except personal services, and issues instructions and advises and assists on matters related to the application of these policies.

The Office of Agricultural and Chemical Development formulates, recommends, and carries out plans, policies, and programs for research in and development of experimental new and improved forms of fertilizers and processes for their manufacture; for testing and demonstrating the value and best methods of fertilizer use as an aid to soil and water conservation and to improved use of agricultural and related resources; for developing, operating, and maintaining facilities to serve as a national laboratory for the dual purposes of research in chemistry and chemical engineering in the development and production of experimental fertilizers and the design and testing of improved manufacturing processes, and for the production and provision of basic chemical materials and services in the munitions field essential to national defense; for readjustment of agricultural areas affected by TVA operations; and for related activities having to do with the management and use of agricultural resources and with national defense.

The Office of Engineering Design and Construction participates in the planning and provides or obtains the architectural treatment, engineering design, and construction of all permanent structures and permanent engineering works which are authorized to be built in the TVA program, in accordance with the requirements determined by the offices and divisions having program responsibilities for such structures and works, except for power transmission, distribution, and communication facilities and switchhouses at substations not adjacent to generating stations; and provides other engineering, architectural, and construction services as feasible and economical.

The Division of Environmental Planning recommends, develops, coordinates, and carries out programs and activities related to TVA's interests in environmental quality of the region. It reviews and evaluates the environmental impacts of programs and activities proposed and carried out by other offices and divisions and provides technical guidance and assistance as needed to assure that appropriate environmental protection features are planned and implemented. It conducts field monitoring and environmental quality studies and investigations at TVA installations. It provides environmental data and technical assistance to state and local agencies. It coordinates and administers environmental

research and demonstration projects carried out by TVA in cooperation with other agencies and organizations. It serves as TVA's liaison with other governmental agencies concerned with environmental planning and protection. In collaboration with other divisions, it develops and applies programs to assess and control potential hazards in the work environment of TVA employees.

The Division of Medical Services develops, recommends, and executes plans and policies related to the health of employees and of the public affected by TVA activities, and to TVA's interests in community health education and health planning. It participates in medical research and development activities, demonstrations, and other cooperative activities with Federal, state, and local agencies and other organizations.

The Office of Power develops, recommends, and appraises objectives, plans, policies, and programs, and carries out approved policies, programs, and activities for the generation, transmission, and utilization of electric power; forecasts future needs of the power program and plans means and methods of meeting those needs; and cooperates with other TVA organizations in carrying out TVA's multiple-purpose programs involving power activities.

The Office of Tributary Area Development administers TVA's interests in comprehensive activities designed to obtain maximum economic progress in tributary areas of the Tennessee Valley region. It works with state and Federal agencies and with local governmental and citizen groups in organizing for, planning, and carrying out unified resource development programs in individual areas. It administers contracts for related studies and demonstrations. It coordinates the participation of other TVA offices and divisions in all stages of tributary area planning and development.

The Division of Forestry, Fisheries, and Wildlife Development formulates, recommends, and conducts investigative and development programs in forestry, fisheries, and wildlife, directed toward maximum sustained production and use of these resources for their contribution to the regional economy and environment. It maintains cooperative relationships with Federal, state, and other appropriate agencies and industries concerned with these resources.

The Division of Navigation Development and Regional Studies develops, recommends. and carries out plans, policies, and programs for the navigation engineering development of the Tennessee River system and for its full and effective use in development of the region; conducts studies and research and advises and assists the General Manager, offices, and divisions on social, economic, governmental relationships, and regional planning problems and opportunities of importance to development of the region; and performs related activities.

The Division of Reservoir Properties develops, recommends, and carries out plans, policies, and activities relating to TVA's interests in recreation resources development; administration of TVA lands not managed by program divisions; operation and upkeep of dam reservations; site planning and landscape architectural services; property protection and law enforcement; visitor information at appropriate TVA properties; coordination of nonmilitary defense measures; and employee housing and related facilities. It provides specialized services on TVA lands and reservations for other programs when in the interest of efficiency and economy.

The Division of Water Control Planning develops, recommends, and administers plans, policies, and programs for flood control and for multipurpose river system control and regulation in cooperation with other TVA organizations and in accord with the requirements of the TVA Act; and for study of local flood problems and development of relationships with state and local governments and groups to assist them in development and promotion of control measures. It cooperates with other TVA organizations and outside groups in planning water resource projects with total economic development of local economies as a basic objective.

Land Between the Lakes develops, recommends, and carries out plans and activities for the 170,000-acre area to demonstrate the unified use of its natural resources for outdoor recreation, conservation education, and related purposes for the economic, social, and educational benefit of the Nation and the region.[36]

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[36]"Organization of the Tennessee Valley Authority," Organization Bulletin, I TVA, Administrative Releases, Office of the General Manager, January 1, 1973.

APPENDIX F

RETRANSLATION METHOD

RETRANSLATION METHOD

This is essentially a method to build a questionnaire based on choices and items relevant to the respondents. It is especially useful for items which utilize rating scales or rank ordered items. It is therefore useful for getting the respondents to make more accurate judgments regarding their concerns and the extent of problems, constraints, issues, and needs. Essentially, the questionnaire builder begins with a hypothesis instrument and then, using interviews and other personal contact techniques, translates the instrument item into terms which are drawn from the direct experience of those similar to the respondents. This involves translating the data gathered from the personal contacts made into the final instrument items, using the hypothesis instrument.

The judgments are made not in response to global generalizations, but instead are in response to specific statements of examples about best case and worst case situations. For example, one could be asked to make a judgment about the lack of interest or concern in environmental education. However, stated in this manner this is a global generalization. Instead, a scale would be constructed, anchored at the low end by a statement which expresses a positive example

situation with respect to the generalization, whereas the high end of the scale is anchored to a statement which expresses a negative situation.

In constructing such a scale, interviews are conducted with individuals similar to those in expected respondent groups. In the interview the individual is asked, "What observable situation or behavior best expresses a lack of interest or concern for environmental education?" The answer might be: "Environment is only a fad!" Then the interviewer asks for a statement of the most positive situation or behavior which would show the greatest interest or concern. The answer to this might be: "Commitment of fiscal and other resources for developing, implementing, and operating environmental education programs." By conducting a series of interviews, a range of statements expressing degrees of concern and interest is obtained. Four statements are selected which best represent the most negative, most positive, and two in between. These four statements are then placed along a seven-point scale as illustrated below:

1	2	3	4	5	6	7
Most Positive Statement		Moderately Positive		Moderately Negative		Most Negative Statement

Utilizing this procedure, an entire questionnaire is then designed so that it covers all of the concerns, problems, constraints, issues, or needs to be surveyed.

Through the use of the retranslation method, planners can get a thorough assessment of people's judgments of the level of their concern or extent of their constraint using relevant and understandable

questions. This increases greatly the reliability and the validity of the questionnaire results. Through the use of the computer, planners can compute means and standard deviations for the responses of individuals, groups, or the entire response sample. Planners can also make an analysis of the variance of the responses between the individuals or groups. All of this can be done for single questionnaire items, groups of questionnaire items, or for all questionnaire items.

APPENDIX G

SAMPLE QUESTIONNAIRE NO. 1: ENVIRONMENTAL CONCERNS

SAMPLE QUESTIONNAIRE NO. 1: ENVIRONMENTAL CONCERNS

What do you feel are the most urgent environmental concerns? (Please rank the major categories by number in order of priority. Do the same for each of the elements within the categories.)

Major Categories

_____ Population Problems
_____ Transportation Problems
_____ Energy Problems
_____ Resource Depletion
_____ Natural Environment
_____ Aesthetics
_____ Materialism
_____ Planning, Design, and Construction Problems
_____ Economic-Social-Cultural Problems
_____ Knowledge Gaps
_____ Health Hazards
_____ Water Problems
_____ Land Use Problems
_____ Air Problems
_____ Others*

Elements Within Major Categories

Population Problems

_____ Distribution
_____ Growth rate
_____ Rural out-migration
_____ Drain on nonrenewable resources
_____ Others*

Sample Questionnaire No. 1 (continued)

Transportation Problems

_____ Highway construction
_____ Lack of adequate mass transit systems
_____ Traffic congestion
_____ Others*

Energy Problems

_____ Fuel shortages
_____ Lack in development of alternate energy resources
_____ Lack of efficiency in use and production
_____ Others*

Resource Depletion

_____ Lack of recycling for nonrenewable resources
_____ Improper management of renewable resources
_____ Others*

Natural Environment

_____ Endangered animal species
_____ Endangered plant species
_____ Loss of fishery and wildlife resources
_____ Loss of natural habitat
_____ Others*

Aesthetics

Distracting:

_____ Sights
_____ Sounds
_____ Smells
_____ Others*

Materialism

_____ Excessive waste in packaging
_____ Lack of durable, long-lasting goods
_____ Status products
_____ Consumerism (product knowledge)
_____ Others*

Sample Questionnaire No. 1 (continued)

Planning, Design, and Construction Problems

_____ Aesthetically and functionally poor architectural design
_____ Lack of comprehensive regional planning
_____ Lack of environmental understanding and concern among planners, designers, and contractors
_____ Lack of planning to prevent future environmental problems and to solve current problems
_____ Inadequate and shoddy construction
_____ Others*

Economic-Social-Cultural Problems

_____ Apathy and lack of leadership in problem solving
_____ Failure of society to meet human psychological needs
_____ Harmful social and work environments
_____ Lack of adequate housing
_____ Lack of adequate job opportunities
_____ Life styles which are detrimental to environmental quality
_____ Loss of cultural identity and cultural shock
_____ Poverty
_____ Consumer problems (prices)
_____ Others*

Knowledge Gaps

_____ Lack of programs to find and promote solutions to environmental problems
_____ Lack of solutions to environmental problems
_____ Lack of understanding of environmental problems
_____ Others*

Health Hazards

_____ Air pollution
_____ Pesticides, herbicides, and toxic metals
_____ Food additives
_____ Noise
_____ Radiation
_____ Water pollution
_____ Others*

Water Problems

_____ Contamination of ground and surface waters by chemicals, dyes, etc.
_____ Flood control
_____ Lack of water use plans
_____ Limitation of fresh water supplies

Sample Questionnaire No. 1 (continued)

Water Problems (continued)

_____ Sedimentation
_____ Thermal discharges
_____ Soft waste disposal
_____ Solid waste disposal
_____ Agricultural runoff (fertilizers, pesticides, and herbicides)
_____ Others*

Land Use Problems

_____ Erosion
_____ Inadequate zoning and planning
_____ Loss of parks, open space, wetlands, and natural areas
_____ Siting of facilities, e.g., nuclear power plants, power transformers and lines, etc.
_____ Loss of agricultural lands due to urbanization and inundation
_____ Mining operations
_____ Solid waste disposal
_____ Visual blight (litter, billboards, etc.)
_____ Lack of land ethic
_____ Others*

Air Problems

Emissions:

_____ Trash burning, furnaces in homes
_____ Industrial and power plants
_____ Automobiles, trucks, buses, airplanes, motorcycles
_____ Others*

*Difficulties in citing the many concerns on this form cause the writer to urge you to provide any additional examples you might think of.

NOTE: Each questionnaire or set of questionnaires would include (1) space for the respondent to place his or her name, profession, and address; (2) the definition of environmental education for purposes of the situation assessment and resource inventory; and (3) special directions for completing the questionnaires.

This sample questionnaire contains information which can be used inside and/or outside TVA.

APPENDIX H

SAMPLE QUESTIONNAIRE NO. 2: PROGRAM NEEDS

SAMPLE QUESTIONNAIRE NO. 2: PROGRAM NEEDS

What are the needs which must be met in order to make an environmental education program operational? (Please rank by number in order of priority the ten needs which you feel are most important. If the need is not applicable in your particular situation, please put "N/A" in the space.)

There is need for:

_____ a central office or planning unit.

_____ leadership.

_____ coordination of efforts.

_____ improved communications between environmental education efforts.

_____ plans of action showing what needs to be done, how to do it, and the resources available.

_____ technical assistance.

_____ training programs for nongovernment and government personnel.

_____ programs utilizing the mass media.

_____ accessible information about environmental problems and conditions both now and projected for the future.

_____ accessible information about environmental education programs, activities, methods, materials, etc.

_____ accessible information describing the baseline condition of the environment in the Tennessee Valley region.

Sample Questionnaire No. 2 (continued)

_____ accessible information which periodically updates the information about the conditions of the environment in the Tennessee Valley.

_____ curriculum, audio-visual and other enrichment material.

_____ programs for community members to work toward achieving the environmental education goals, using approaches consistent with the TVA definition of environmental education.

_____ academic and intern programs.

_____ research and development which provide a balanced set of judgments and projections of future environmental conditions based on various sets of interrelated environmental problems.

_____ fund raising efforts for environmental education.

_____ facilities and expertise which enable individuals and groups to conduct research and development to find solutions to environmental problems consistent with the view of the future desirable environmental conditions.

_____ identification or production of evaluation instruments which are used to determine program effectiveness.

_____ utilization of evaluation results to determine program effectiveness and to make any appropriate modification and adjustments to the program.

_____ others.

NOTE: Each questionnaire or set of questionnaires would include (1) space for the respondent to place his or her name, profession, and address; (2) the definition of environmental education for purposes of the situation assessment and resource inventory; and (3) special directions for completing the questionnaires.

This sample questionnaire contains information which can be used inside and/or outside TVA.

Planners should consider developing a rating scale for each of the questionnaire items.

APPENDIX I

SAMPLE QUESTIONNAIRE NO. 3: SERVICES--PRESENT AND FUTURE

SAMPLE QUESTIONNAIRE NO. 3: SERVICES--PRESENT AND FUTURE

What types of environmental education or related services are you now providing, and what types are you interested in providing in view of your existing or projected resources? (Place a mark in the left most column next to the item which best describes what you are now doing. In the second column, place a mark next to the item which indicates what you would be interested in doing, given your present or projected resources and capabilities. If you are not providing the service or are not interested, please put "N/A" in the space.)

Presently Doing	Interested In Doing	General Categories of Services
____	____	Technical assistance
____	____	Environmental data, information, and educational material
____	____	Financial assistance
____	____	Specific inhouse programs, projects, or activities
____	____	Others

Services by Categories

Presently Doing	Interested In Doing	Technical Assistance
____	____	Participation in community action projects, recycling centers, etc.
____	____	Participation on advisory committees, councils, etc.

Sample Questionnaire No. 3 (continued)

Services by Categories (continued)

Presently Doing	Interested In Doing	Technical Assistance
____	____	Preparation of master plans or workplans
____	____	Preparation of grant proposals
____	____	Preparation of plans for educational facilities, e.g., school sites, environmental study areas, etc.
____	____	Preparation of legislation, rules, and regulations
____	____	Preparation and selection of learning material, e.g., books, films, etc.
____	____	Planning, organizing, and participating in workshops, conferences, seminars, etc.
____	____	Designing programs for preservice and inservice education at the higher education level
____	____	Designing specific environmental education learning activities, research projects, etc.
____	____	Development of communications and cooperative working relationships with educational institutions, agencies, organizations, and groups concerned with environmental education
____	____	Development of curriculum, audio-visual aids, exhibits, etc.
____	____	Review and evaluation of materials and programs
____	____	Identification and recommended use of appropriate resource people
____	____	Others

Sample Questionnaire No. 3 (continued)

Services by Categories (continued)

Presently Doing	Interested In Doing	
		Environmental Data, Information, and Educational Material
____	____	Provision of environmental data, information, and educational material about your own inhouse programs or projects
____	____	Provision of environmental data, information, and educational material about programs or projects external to your agency or organization
____	____	Provision of instructional material or learning packets and audio-visual aids on energy, minerals, land use, etc.
____	____	Others
		Financial Assistance
____	____	Funding of educational demonstrations and unique projects
____	____	Funding of research projects
____	____	Others
		Specific Inhouse Programs, Projects, or Activities
____	____	Production of specific material which explains inhouse programs
____	____	Provision of lands for environmental studies
____	____	Provision for programs, tours of power plants, dam sites, etc.
____	____	Provision of clearinghouse services
____	____	Provision for intern opportunities in environmental fields

Sample Questionnaire No. 3 (continued)

Services by Categories (continued)

Presently Doing	Interested In Doing	Specific Inhouse Programs, Projects, or Activities
____	____	Planning and conducting workshops for users of facilities
____	____	Planning and conducting training programs and/or workshops for employees
____	____	Planning and conducting conferences dealing with air quality, energy, population, etc., aimed at specific target groups
____	____	Operation of day use program
____	____	Operation of resident program
____	____	Operation of mobile environmental education laboratory
____	____	Operation of pollution monitoring systems
____	____	Operation of environmental research program
____	____	Others

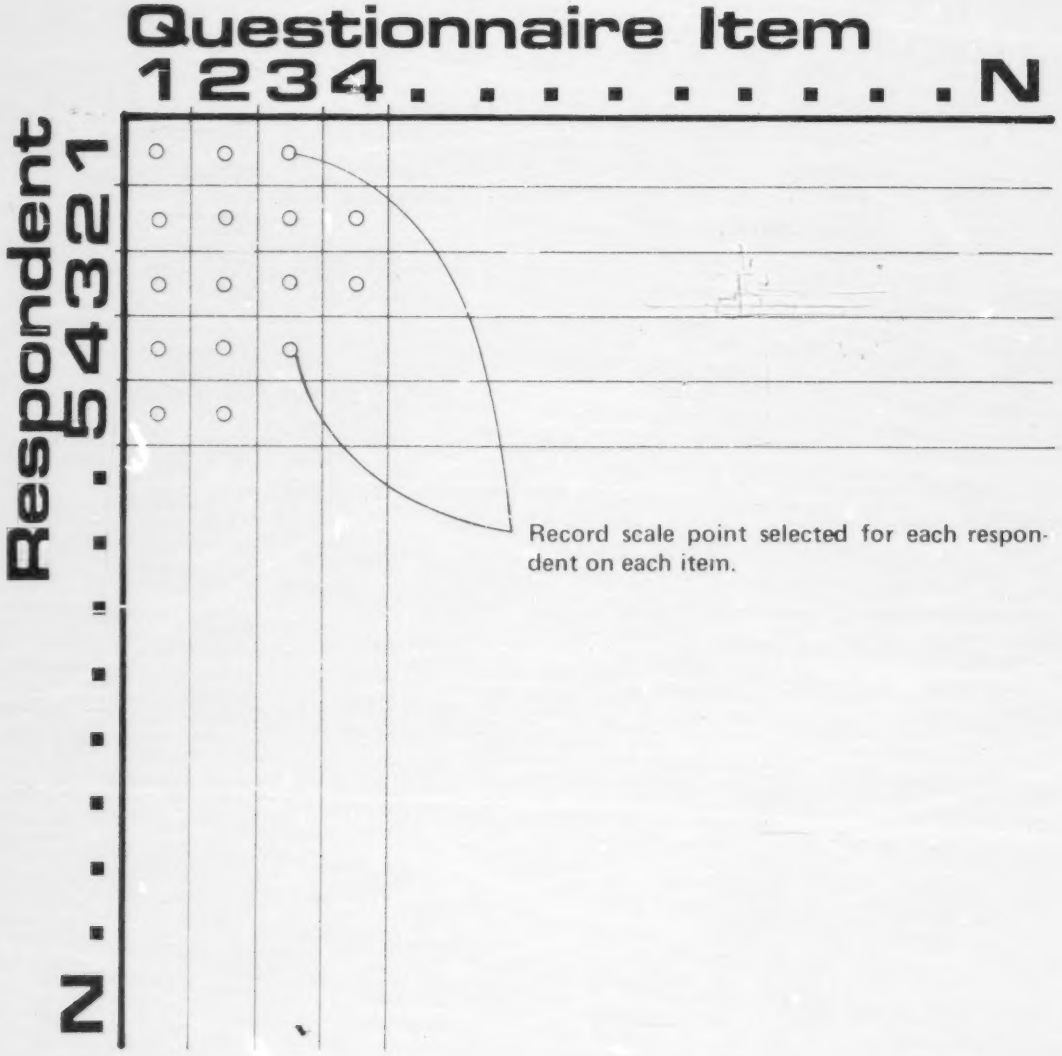
NOTE: Each questionnaire or set of questionnaires would include (1) space for the respondent to place his or her name, profession, and address; (2) the definition of environmental education for purposes of the situation assessment and resource inventory; and (3) special directions for completing the questionnaires.

This sample questionnaire contains information which can be used inside and/or outside TVA.

APPENDIX J

DATA CONSOLIDATION AND ANALYSIS MATRIX

Data Consolidation & Analysis Matrix



NOTE: From the above data planners can compute means and standard deviation for each respondent, for the entire response sample or any subgroup within the response sample. Planners can also determine an analysis of variance between respondents or subgroups of respondents.

APPENDIX K

SAMPLE QUESTIONNAIRE NO. 4: PROGRAM POSSIBILITIES

SAMPLE QUESTIONNAIRE NO. 4: PROGRAM POSSIBILITIES

Which of the following program elements do you believe would best ensure the achievement of the goals provided to you along with this questionnaire? (Please rank the major categories by number in order of priority. Do the same for each of the individual programs or elements within the categories or sub-categories.)

Major Categories

_____ Planning
_____ Curriculum
_____ Communications
_____ Training
_____ Material
_____ Facilities
_____ Community Projects
_____ Others*

Elements Within Major Categories

Planning

_____ Curriculum
_____ Master plans
_____ Special programs on environmental problems
_____ Workplans
_____ Others*

Curriculum (educational classes)

_____ Preschool
_____ Elementary
_____ Secondary
_____ Vocational
_____ Higher education
_____ Continuing and adult education
_____ Others*

Sample Questionnaire No. 4 (continued)

Communications

_____ Clearinghouse
  _____ Data and information collection, storage, retrieval, and dissemination
  _____ Leadership--facilitating, assisting, directing coordinating, etc.
_____ Media (TV, radio, newspapers, etc.)
  _____ Special programs on environmental problems
  _____ Editorials
  _____ Commercials
_____ Others*

Training (inservice, preservice, workshops, seminars, conferences, etc.)

_____ Professional educators
  _____ Administrators and managers (principals, superintendents, deans, and presidents)
  _____ Supervisors, consultants, and specialists
  _____ Instructors (teachers, professors, etc.)
  _____ Others*
_____ Government personnel
  _____ Administrators, managers, and supervisors
  _____ Trades and labor
  _____ Specialists and technicians
  _____ Professionals (physicians, attorneys, architects, etc.)
  _____ Clerical and other support personnel
  _____ Others*
_____ Professionals
  _____ Physicians
  _____ Attorneys at law
  _____ Architects and planners
  _____ Engineers
  _____ Accountants
  _____ Others*
_____ Special interest groups
  _____ Environmental
  _____ Ethnic and minority
  _____ Others*
_____ Politicians
  _____ Legislators
  _____ Non-civil service government administrative people (political appointees)
  _____ Judicial people
  _____ Others*

Sample Questionnaire No. 4 (continued)

Material

_____ Audio-visual (films, slides, etc.)
_____ Enrichment (population, air, water, etc.)
_____ Textbooks, workbooks, pamphlets, bulletins
_____ Others*

Facilities

_____ Outdoor education or nature interpretive centers
_____ Parks, zoos, museums, botanical gardens, planetariums
_____ Community environmental action centers
_____ Environmental study areas
_____ Recreation/camping
_____ Others*

Community Projects

_____ Environmental awareness
_____ Cleanup or beautification campaigns
_____ Recycling centers
_____ Political or legislative efforts
_____ Public meetings and hearings
_____ Planning of model cities, new towns, etc.
_____ Other special programs on environmental problems
_____ Others*

*Difficulties in citing the many concerns on this form cause the writer to urge you to provide any additional examples you might think of.

NOTE: Each questionnaire or set of questionnaires would include (1) space for the respondent to place his or her name, profession, and address; (2) the definition of environmental education for purposes of the situation assessment and resource inventory; and (3) special directions for completing the questionnaires.

This sample questionnaire contains information which can be used inside and/or outside TVA.

APPENDIX L

SAMPLE QUESTIONNAIRE NO. 5: RESOURCE INVENTORY

SAMPLE QUESTIONNAIRE NO. 5: RESOURCE INVENTORY

Which of the following resources does your organization have which could contribute to the program or program elements listed below?

(The title of the program, program element, or group of program elements from the interpretation of questionnaire data is given here. In this sample questionnaire, the writer has used the CLEARINGHOUSE element which is found in Sample Questionnaire No. 4, under Communications, page 119.)

1. Do you have any personnel who can perform environmental education program services? If so, who are the personnel? What are the services, and for whom are they provided? When were they first provided? Where are they provided? Why are they provided? How can they be obtained? At what cost?

2. Do you have financial resources for funding environmental education demonstrations, unique programs, or projects? If so, what are the funds to be used for? When were the funds first provided? Where are projects funded? Why are funds provided? Who has responsibility for these resources?

3. Do you have any environmental education audio-visual aids, equipment, or other material? If so, what are they? When were they prepared? Where are they? Why were they prepared? Who has responsibility for this equipment and material? Available at what cost?

4. Do you have any sites or facilities which can be used for conducting environmental education meetings, environmental investigations/studies, or research? If so, what are they? When were they developed? Where are they? Why were they developed? Who has the responsibility for these sites or facilities? Available at what cost?

NOTE: Each questionnaire or set of questionnaires would include (1) space for the respondent to place his or her name,

Sample Questionnaire No. 5 (continued)

profession, and address; (2) the definition of environmental education for purposes of the situation assessment and resource inventory; and (3) special directions for completing the questionnaires.

This sample questionnaire contains information which can be used inside and/or outside TVA.

APPENDIX M

SAMPLE QUESTIONNAIRE NO. 6: PROGRAM CONSTRAINTS

SAMPLE QUESTIONNAIRE NO. 6: PROGRAM CONSTRAINTS

What are the constraints to planning, implementing, and operating the environmental education programs or elements listed in the resource inventory questionnaire? (Please rank by number in order of priority the ten constraints which you feel are most important. If the constraint is not applicable in your particular situation, please put "N/A" in the space.)

Inside TVA	Outside TVA	Constraints
_____	_____	Lack of interest or concern
_____	_____	Lack of awareness of environmental problems
_____	_____	Lack of knowledge about what to do or how to do it
_____	_____	Lack of understanding of environmental problems
_____	_____	Lack of qualified personnel responsible for education
_____	_____	Lack of accurate information about the condition of the environment
_____	_____	Lack of availability or access to the information that has already been collected
_____	_____	Lack of programs and material which tell both sides of environmental issues
_____	_____	Lack of reasoned professional judgments and predictions about the future conditions of the environment

Sample Questionnaire No. 6 (continued)

Inside TVA	Outside TVA	Constraints
____	____	Lack of sound, accurate program material tailored to local and regional situations
____	____	Lack of programs and material which emphasize the balanced approach toward growth and development
____	____	Lack of political support and legislation on environmental education programs
____	____	Lack of agreement as to the definition and philosophy of environmental education
____	____	Lack of cooperation across disciplines
____	____	Lack of physical and material resources
____	____	Lack of time devoted to planning, implementing, and operating environmental education programs
____	____	Lack of central direction, leadership, and coordination of environmental education efforts
____	____	Lack of fiscal resources
____	____	Lack of knowledge about assigned roles and responsibilities
____	____	Lack of faith or confidence in the results
____	____	Empire building
____	____	Poor management of existing educational resources
____	____	Personal liability and transportation problems within school systems
____	____	Educators do not have enough freedom to depart from the traditional curricula

Sample Questionnaire No. 6 (continued)

Inside TVA	Outside TVA	Constraints
____	____	Low priority is assigned to environmental education
____	____	Bureaucratic rigidities and inefficiencies
____	____	Others

NOTE: Each questionnaire or set of questionnaires would include (1) space for the respondent to place his or her name, profession, and address; (2) the definition of environmental education for purposes of the situation assessment and resource inventory; and (3) special directions for completing the questionnaires.

Planners should consider developing a rating scale for each of the questionnaire items.

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